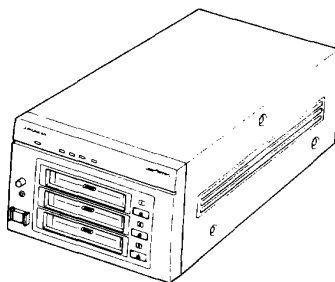


Service Manual

PIONEER
The Art of Entertainment



ORDER NO.
RRV1022

The chapter 1 of this Service Manual will not be reprinted. On your additional orders, we may supply only the chapter 2. For the chapter 1, please make copies and attach to the chapter 2 at your side if necessary.

CD-ROM CHANGER

DRM-1804X

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model	Power Requirement	Remarks
	DRM-1804X		
TUCGM	○	AC100-240V	—

CAUTION

1. High Voltage — Electric Shock

Use care when handling the switching regulator (PWRB assembly) heat sink, which operates at high voltage.

2. Switching Regulator Oscillation Stops

The IC circuit protector functions in case of a DC power short. But when a 10V DC short occurs or the power is turned on without load, the switching regulator stops operating because the rectifying capacitor is charged ; operation is disabled until the capacitor discharges. Capacitor discharge takes about 15 minutes after power off. Before power on, confirm the DC potential is 50V or less between the switching regulator heat sink and jumper wire (RJ02).

CONTENTS

CHAPTER 1

1.1 SAFETY INFORMATION	1-2
1.2 SPECIFICATIONS	1-4
1.3 PANEL FACILITIES	1-5
1.4 BLOCK DIAGRAM	1-6
1.5 ADJUSTMENTS	1-7
1.6 PARTS LIST FOR PACKING AND EXPLODED VIEWS	1-23
1.7 PCB PARTS LIST	1-27

CHAPTER 2

2.1 PACKING AND EXPLODED VIEWS ...	2-2
2.2 SCHEMATIC AND PCB CONNECTION DIAGRAMS	2-13

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T-DFI FEB. 1994 Printed in Japan

CHAPTER 1

1.1 SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual. Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.



WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).

When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.



NOTICE

(FOR CANADIAN MODEL ONLY)

Fuse symbols  (fast operating fuse) and/or  (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

REMARQUE

(POUR MODÈLE CANADIEN SEULEMENT)

Les symboles de fusible  (fusible de type rapide) et/ou  (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

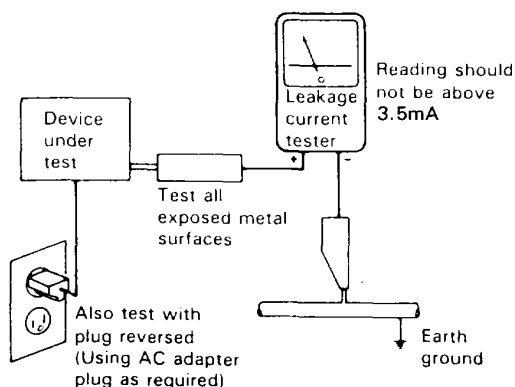
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 3.5mA



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a Δ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

(FOR EUROPEAN MODEL ONLY)

VARO!

AVATTAESSA JA SUOJALUKITUS
OHITETTAESSA OLET ALTTIINA
NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE.
ÄLÄ KATSO SÄTEESEEN.

ADVERSEL:

OSYNLIG LASERSTRÅLING VED ÅBNING
NÅR SIKKERHEDSÅFBRYDERE ER UDE AF
FUNKTION UDGÅ UDSÆTTELSE FOR
STRÅLING.

VARNING!

OSYNLIG LASERSTRÅLNING NÅR DENNA
DEL ÄR ÖPPNAD OCH SPÄRREN
ÄR URKOPPLAD. BETRakta EJ STRÅLEN.



LASER
Kuva 1
Lasersäteilyn
varoituserkki

WARNING!

DEVICE INCLUDES LASER DIODE WHICH
EMITS INVISIBLE INFRARED RADIATION
WHICH IS DANGEROUS TO EYES. THERE IS
A WARNING SIGN ACCORDING TO PICTURE
1 INSIDE THE DEVICE CLOSE TO THE LASER
DIODE.



LASER
Picture 1
Warning sign for
laser radiation

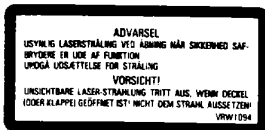
IMPORTANT

THIS PIONEER APPARATUS CONTAINS
LASER OF CLASS 1.
SERVICING OPERATION OF THE APPARATUS
SHOULD BE DONE BY A SPECIALLY
INSTRUCTED PERSON.

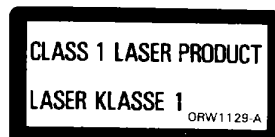
LASER DIODE CHARACTERISTICS

MAXIMUM OUTPUT POWER: 5 mw
WAVELENGTH: 780-785 nm

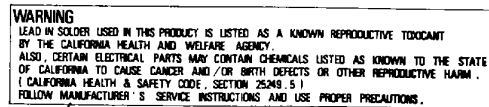
LABEL CHECK



VRW1094



ORW1129



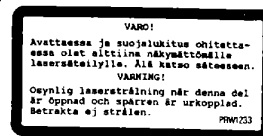
ORW1069



PRW1018



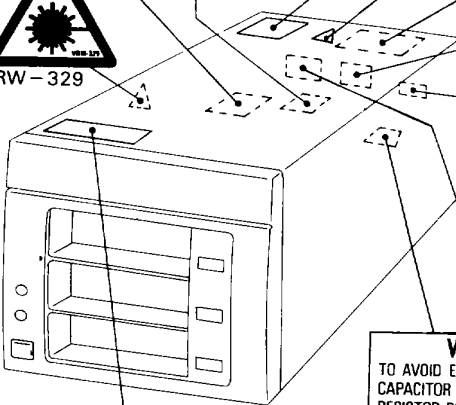
DRW1566



PRW1233



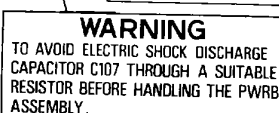
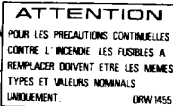
VRW-329



VRW1105



DRW1455



DRW1564 - A

DRW1564

DRW1533



Additional Laser Caution

1. Laser Interlock Mechanism

The ON/OFF (ON : low level, OFF : high level) status of the LPS1 and LPS2 signals of Clamp Switch (S601) for detecting the loading state is detected by the system microprocessor, and the design prevents laser diode oscillation when the LPS1 signal is not OFF (high level) and LPS2 signal is not ON (low level) (clamped state). Thus, interlock will no longer function if the LPS2 signal of Clamp Switch (S601) is deliberately shorted to GND. The interlock does not also operate in the test mode*. Laser diode oscillation will continue, if pin 29 of PM3003A (IC4) on SRVB assembly is connected to GND, pin 30 of IC4 is connected to Vcc (+5V) or else the terminals of Q1 are shorted to each other (fault condition).

2. When the cover is opened with the servo mechanism block removed and turned over, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 laser beam.

* Refer to page 1-7.

1.2 SPECIFICATIONS

[General]

Disc	CD-ROM disc (conforming to YELLOW BOOK) CD audio disc (conforming to RED BOOK)
Data capacity	18 discs (max 13 Gbytes)
Data sector size	2048/512 bytes/sector
Data transmission speed	Burst; 4.2 Mbytes/sec 614 kbytes/sec (continuous)
Interface	SCSI 2
Buffer memory	128 kbytes
Average access time	300 ms

[Audio output]

Frequency response (4 Hz to 20 kHz)	± 2 dB
Signal-to-Noise ratio	Min. 95 dB
Total harmonic distortion	Less than 0.1 %
Output level	1.7 Vrms ± 0.5 V (LINE OUT)

[Accessories]

Power cable	1
Six CD-ROM disc magazine	3
Audio connecting cable with RCA plugs	1
Operating Instructions	1
Power switch cap	3

NOTE:

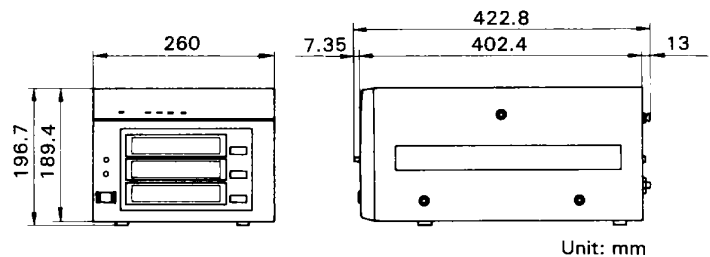
The accessory power supply cord can only be used on the continent of North America. In Europe, do not use the accessory power supply cord. Consult with the company sales representative. "Use Only Safety Licensed Power Supply Cord"

[Others]

Power voltage	AC 100V – 240V, 50/60Hz (automatic sensing)
Power consumption	AC 100V, 0.45A /AC 120V, 0.4A /AC 240V, 0.2A
Dimensions	260 (W) × 196.7 (H) × 422.8 (D) mm 10-1/4 (W) × 7-3/4 (H) × 16-21/32 (D) in
Weight	7.6 kg (16 lb 12 oz)
Operating temperature	5 to 40°C (+ 41°F to + 104°F)
Operating humidity	5 to 85 %
Storage temperature	– 20 to + 60°C (– 4 to + 140°F)
Built-in terminators	

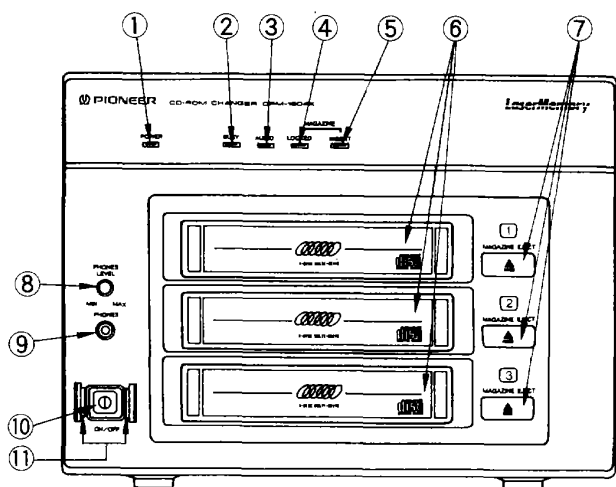
NOTE:

Specifications and design subject to possible modifications without notice due to improvements.

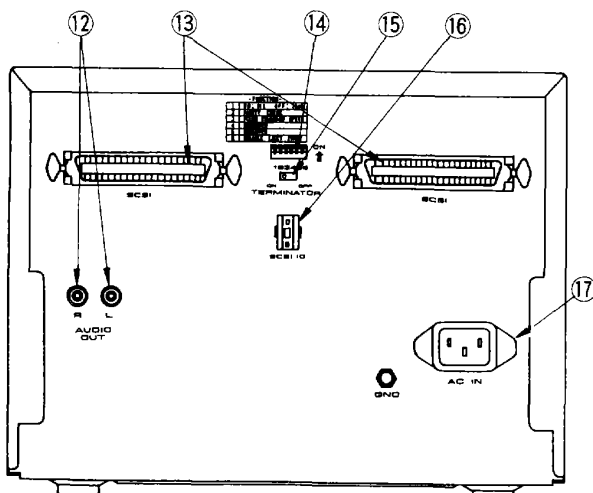


1.3 PANEL FACILITIES

FRONT



REAR



① POWER indicator

Lights up when the power is ON.

② BUSY indicator

Indicates the state of the CD-ROM changer. Lights up orange during reading of CD-ROM data or accessing the SCSI bus.

③ AUDIO indicator

Lights up during audio playback of a CD, or during playback of an audio track of a CD-ROM.

④ MAGAZINE LOCKED indicator

Lights up when ejection of the magazine is disabled.

⑤ MAGAZINE INSERT indicator

Blinks when CD-ROM magazines are not inserted in all three magazine slots.

NOTE:

This unit is designed to operate only when CD-ROM magazines are inserted into all three magazine slots.

⑥ Magazine slots

⑦ Eject buttons (MAGAZINE EJECT 1, 2, 3)

Press one of these buttons to eject the adjacent magazine. However, the magazines will not be ejected when the ejection function has been disabled.

⑧ PHONES LEVEL controller

Controls volume level of the headphones output. The level will increase when the controller is turned clockwise, and decrease when turned counterclockwise.

⑨ PHONES jack

A terminal to connect headphones.

⑩ POWER switch

This switch turns the power supply ON/OFF.

⑪ Power switch cap slot

Install an accessory power switch cap here to prevent inadvertent use of the power switch.

⑫ AUDIO OUT jacks

Outputs CD audio signal. Connect it to a stereo amplifier.

⑬ SCSI connectors

Either connector can be used to connect to a computer or daisy chain to other SCSI devices.

⑭ FUNCTION switches

Set the operation mode of the CD-ROM changer. Be sure to switch the power of the changer OFF before changing the operating mode.

⑮ TERMINATOR ON/OFF switch

Set this switch ON when using the built-in terminator. Otherwise set this switch OFF.

NOTE:

The changer does not supply terminator power for external terminators.

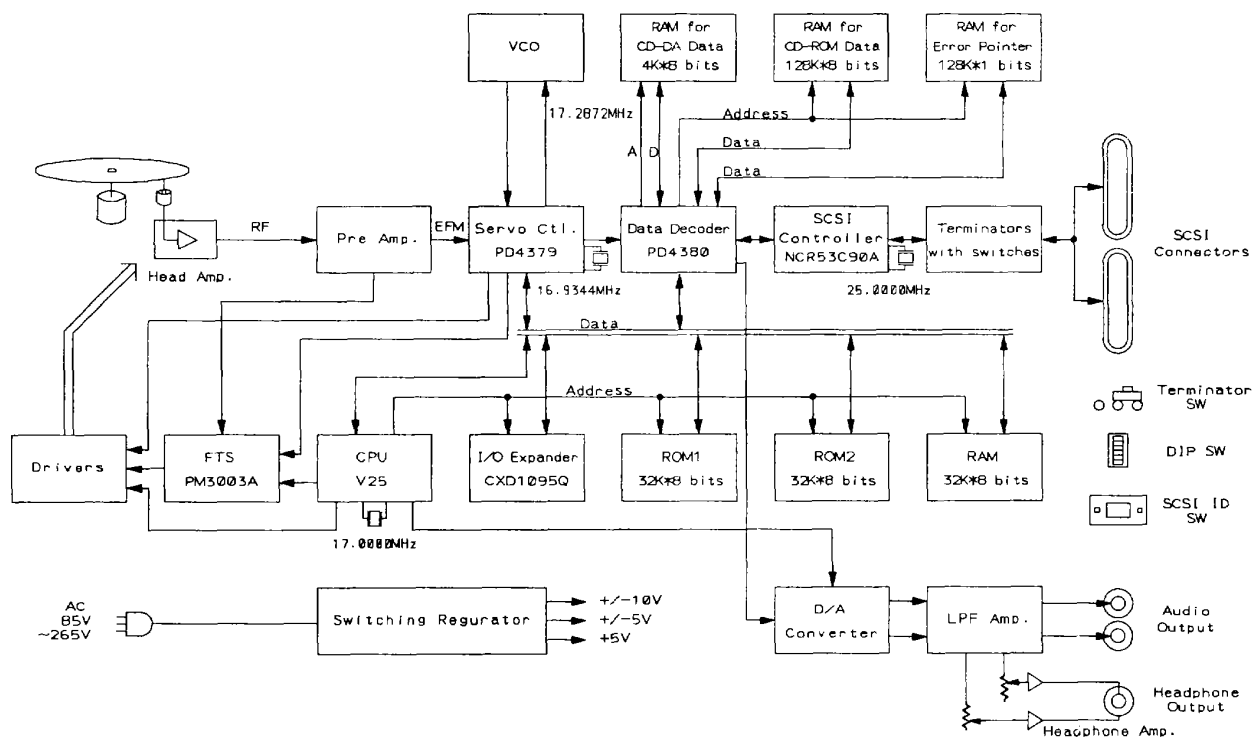
⑯ SCSI ID switches

To assign the SCSI ID number. Be sure to switch the power of the changer OFF before changing the ID number.

⑰ AC IN

Connect to wall outlet. This changer is applicable at AC 100 – 240V 50/60Hz (Automatic sensing). In Europe, do not use the accessory power supply cable. Consult with the company sales representative.

1.4 BLOCK DIAGRAM



1.5 ADJUSTMENTS

● Adjustment and Check Items

Perform the adjustment of this model in the order as shown below.

1. VCO free-run frequency adjustment
2. Focus offset adjustment
3. Grating adjustment
4. Tracking error balance adjustment
5. Pickup radial/tangential adjustment
6. RF level verification
7. Focus servo loop gain adjustment
8. Tracking servo loop gain adjustment
9. VCO free-run frequency re-adjustment
10. Tracking error balance re-adjustment

● Measuring Equipment

1. Dual trace oscilloscope
2. Laser power meter
3. Test disc : YEDS-7 (EIAJ CD-1)
4. Tracking error balance adjustment filter
5. Loop gain adjustment filter
6. Signal generator
7. Frequency counter (measurable over 10MHz)
8. Other general tools

● Adjustment Points and Their Names

- VR1 : Tracking error balance (TRK. BAL)
 VR2 : Tracking servo loop gain (TRK. GAN)
 VR3 : Focus offset (FCS. OFS)
 VR4 : Focus servo loop gain (FCS. GAN)
 VR5 : Laser power
 (This VR is on the HEAD assy)
 VR6 : VCO free-run frequency ($\times 4$ VCO. ADJ)
 VR7 : VCO free-run frequency (PLL OFFSET)
 L2 : VCO adjustment (VCO. ADJ)

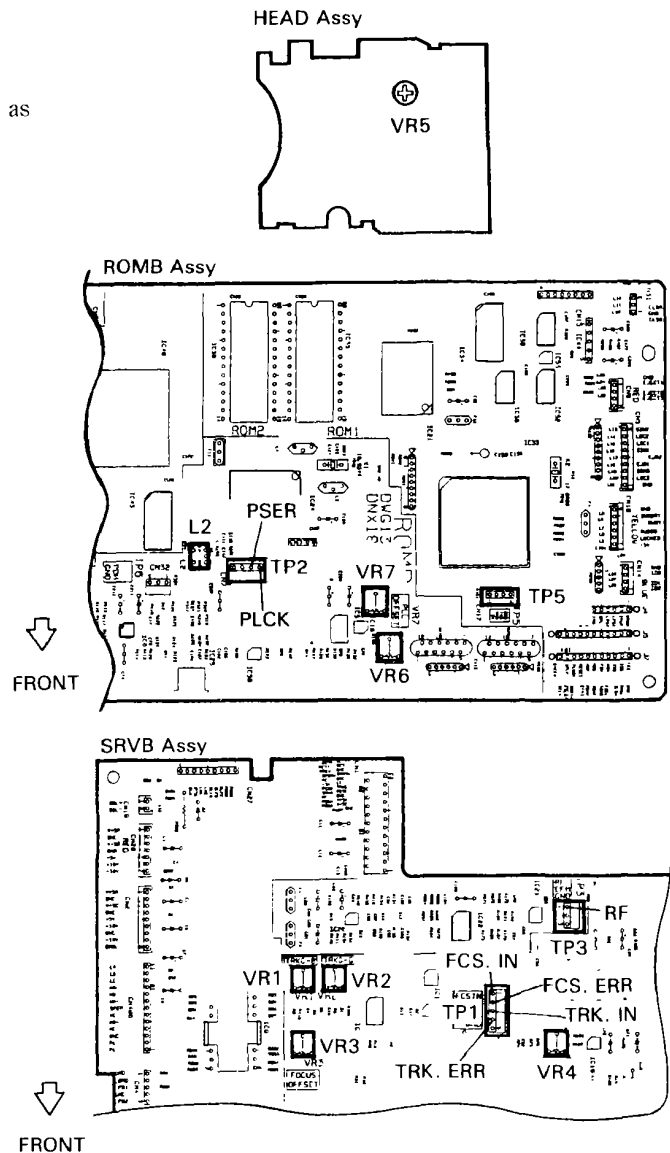


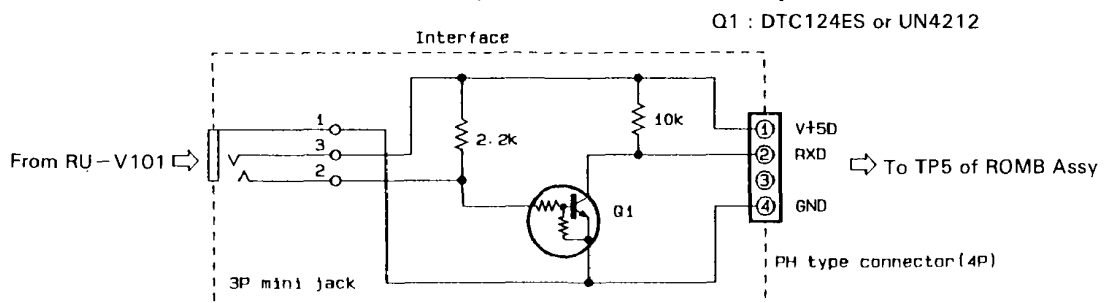
Fig. 1 Adjustment Points

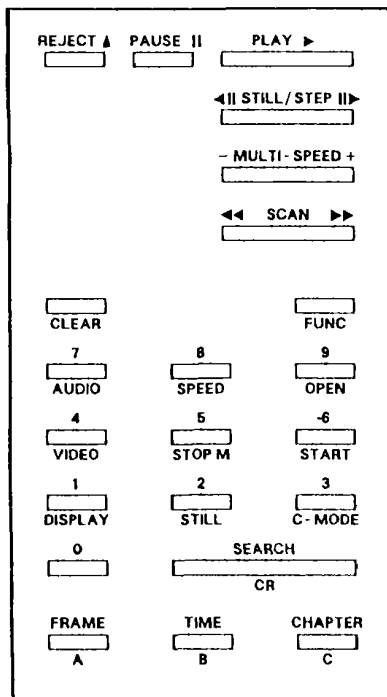
1.5.1 FUNCTION TABLE OF THE REMOTE CONTROLLER (RU-V101) FOR SERVICE

● Test Mode

Shows the function table of the remote controller (RU-V101) for service as follows. When operating the CD-ROM changer directly, it is possible to operate as shown below by connecting the wired-remote control to the CD-ROM with the interface. When using test mode commands, set dip switch "5" in the rear panel to ON before turning power ON.

● Schematic Diagram of the Conversion Jig for Remote Control Operation





RU-V101

REJECT	: Spindle stop
PAUSE	: Pause
PLAY	: Play
STILL/STEP	:] Test command
STILL/STEP	:] Test command
MULTI-SPEED +	:] Test command
MULTI-SPEED -	:] Test command
SCAN	: Scan FWD
SCAN	: Scan REV
CLEAR	: Clear
FRAME	: Frame set
TIME	: Time set
CHAPTER	: Track set
SEARCH	: Search
10 key	: Numerical input
DISPLAY (FUNC + 1)	: No entry
STILL (FUNC + 2)	: No entry
C-MODE (FUNC + 3)	: No entry
VIDEO (FUNC + 4)	: No entry
STOP. M (FUNC + 5)	: Stop marker
START (FUNC + 6)	: Start
AUDIO (FUNC + 7)	: No entry
SPEED (FUNC + 8)	: No entry
OPEN (FUNC + 9)	: Magazine eject

● Test Command

Key Operation	Command	Description
[0] + [TIME]	{0TM}	All servo OFF
[1] + [TIME]	{1TM}	Laser-diode (LD) ON
[2] + [TIME]	{2TM}	Focus ON
[3] + [TIME]	{3TM}	Spindle ON (CLV-A)
[4] + [TIME]	{4TM}	Tracking ON/OFF
[5] + [TIME]	{5TM}	Slider ON/OFF
[6] + [TIME]	{6TM}	Lens UP/DOWN (Twice)
[7] + [TIME]	{7TM}	Spindle UP/DOWN (30sec.)
[8] + [TIME]	{8TM}	Spindle rotation frequency : Normal speed
[9] + [TIME]	{9TM}	Spindle rotation frequency : Fourfold speed
[STILL/STEP >>]	{SF}	1 Track jump : FWD
[STILL/STEP <<]	{SR}	1 Track jump : REV
[*] + [*] + [*] + [MULTI-SPEED +]	{***MF}	*** Track jump : FWD
[*] + [*] + [*] + [MULTI-SPEED -]	{***MR}	*** Track jump : REV

1.5.2 FUNCTION OF PERSONAL COMPUTER FOR SERVICING

Use the floppy disc furnished with the product.

1. Program Installation and Removal

Multi-play control (MPC) has one program to make it resident in memory and another program that removes it from memory.

- (1) MPC. COM : Multi-play control program
- (2) MPCRMV. COM : Removes MPC from memory

MPC is executed as follows :

MPC [Enter]

This entry places MPC in memory. Execution of the next program removes MPC from memory.

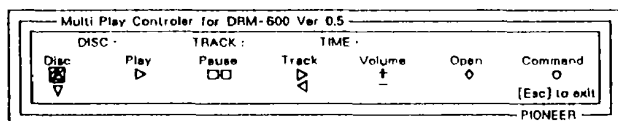
MPCRMV [Enter]

2. Calling the MPC Window

When MPC has been placed in memory and your PC is in the key input wait state

Press the Alt key and the hyphen key at the same to make the MPC window pop up.

Fig. 2 MPC Window



ESC key : Closes MPC window

[←] [→] [↑] [↓] key : Select functions

Space key or enter key : Executes selected function

Direct Selection of Disc

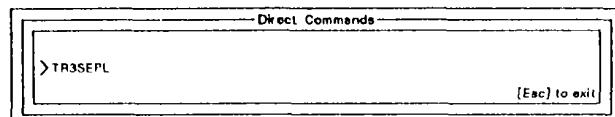
When the cursor is at the [Disc] position

Directly input a number from 1 to 6 to select the disc.

3. Calling a Sub-Window

Execute a [Command] function to make a sub-window pop up, and then a mnemonic command can be executed. Use the ESC key to cancel a sub-window.

Fig. 3 Sub-Window



4. Command List

Notes :

- Set "5" of the DIP (function) switches on the rear panel to ON.
- The complete status "R" is returned when the execution of each command is completed.
- Park mode : A state in which the disc is cramped.
- Home mode : A state in which the disc is released (the disc has returned to the magazine).

● Command List

Command Mnemonic	Command	Explanation
ZO	MAGAZINE OUT	After moving the selector to 18, the address (magazine number) that causes the ejection of the magazine, is to be specified prior to the command. Example : 2ZO (to eject the 2nd magazine from the top)
ZS	DISC SELECT	Enters park mode after removing the specified disc from the magazine and cramping it. The address (DISC number) is to be specified prior to the command. When a single-disc magazine is used, only "1" is effective for the DISC number. Example : 3ZS (to select the third disc from the top of the magazine)
ZR	DISC RETURN	Returns the disc to the magazine and enters home mode.
RJ	REJECT	Stops the disc rotation and enters park mode.
SA	START	Starts the disc rotation. When the first track is an audio track, the disc will pause at the beginning of the track while it will pause at 0 minutes 2 seconds 0 frames in a data track.

Command Mnemonic	Command	Explanation
PL	PLAY	Enters play mode and plays the disc. Automatically stops if the specified command address is overrun during playback. Example : TM2000PL (Pause at 20min. 00sec. frame.)
PA	PAUSE	Enters pause mode. stopping at the current point.
NF	SCAN FORWARD	Rapidly forwards for about 15 seconds. The audio level is attenuated by 12dB during the fast forward operation.
NR	SCAN REVERSE	Rapidly backs for about 15 seconds. The audio level is attenuated by 12dB during the fast back operation.
SE	SEARCH	Searches for the specified address and enters pause mode after the search operation. Example : BK4500SE (to specify a block), TR5SE, 6SE (to specify a track)
SM	STOP MARKER	Sets a stop marker at the specified address. Enters pause mode when passing over the stop marker during playback, clearing the marker. The stop marker is also cleared when the CLEAR or REJECT command is supplied before the stop marker is reached. Example : BK20000SMPL (To pause at 20 minutes 0 second 0 frame after playback)
BK	BLOCK	Uses the address flag to specify blocks. Subsequently, an address entered is regarded as a block number (BK + a 6-digit number).
TM	TIMER	Uses the address flag to specify a time. Subsequently, an address entered is regarded as a time code (TM + a 4-digit number).
TR	TRACK	Uses the address flag to specify a track. Subsequently, an address entered is regarded as a time track number (TR + a 2-digit number).
IX	INDEX	Uses the address flag to specify an index. Subsequently, an address entered is regarded as an index number
CL	CLEAR	Clears the digit buffer (numerical input) and cancels search mode, auto play mode or the stop marker. When the buffer is cleared during a search operation, the pickup stops moving for a pause. Resumes normal operation when the buffer is cleared during an auto play or stop marker operation.
LO	LEAD OUT SYMBOL	Sets a point in the lead-out area to an address. To be used when setting the stop marker on the last track of a disc having 99 tracks. Example : TR99SELOPL
VL	VOLUME	Adjusts the audio playback level. 0 : minimum, 255 : maximum
AD	AUDIO CONTROL	Select the audio outputs. 0 : OFF, 1 : Lch, 2 : Rch, 3 : STEREO, 4 : OFF, 5 : Lch, 6 : Rch, 7 : STEREO Example : 3AD
CM	COMMUNICATION	Sets the communication mode. With the DRM-1804X, only mode 3 can be set. Example : 3CM
KL	KEY LOCK	Activates or deactivate the keys on the front panel. 0 : Activate 1 : Deactivate Example : 1KL

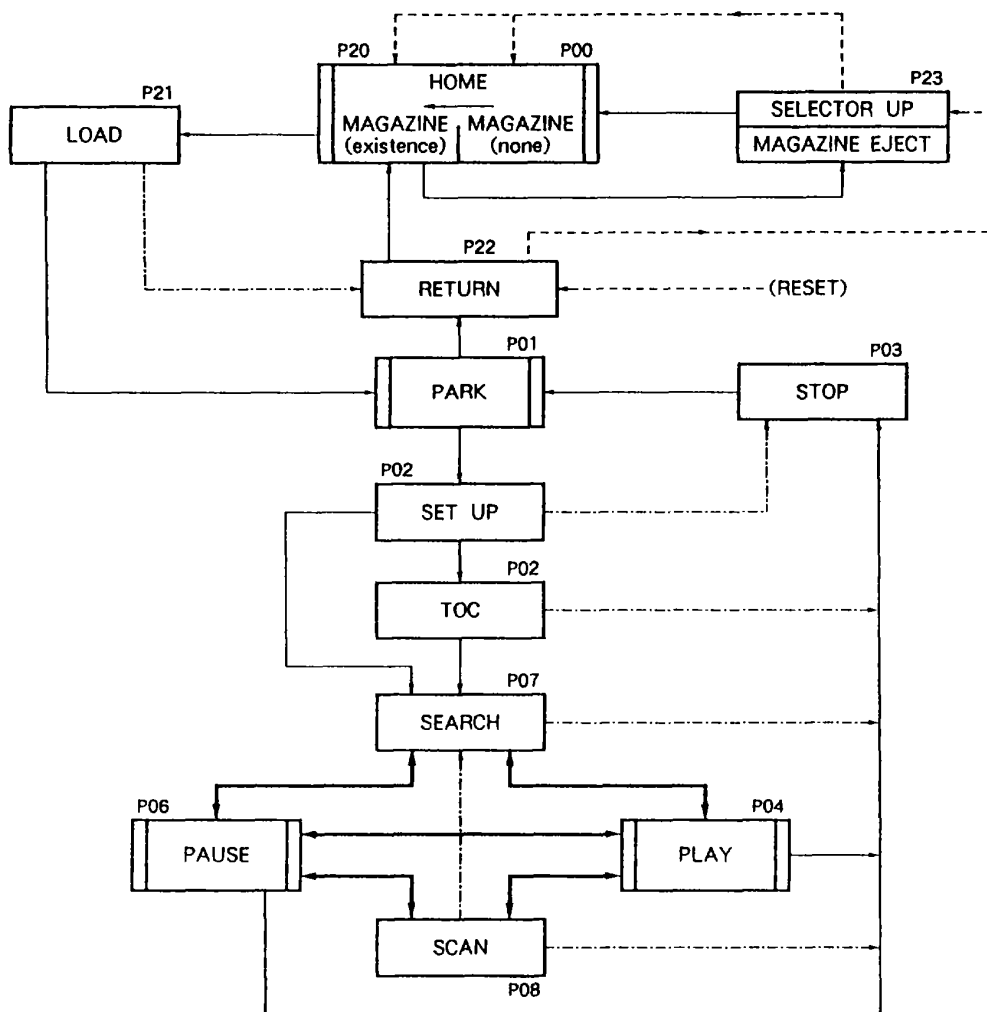
Command Mnemonic	Command	Explanation
? Z	DISC NUMBER REQUEST	Displays a three-digit number which indicates the ordinal of the cramped disc from the top of the magazine. If no disc is cramped, "XXX" is returned. The DISC number will be "1" when a single-disc magazine is used.
? B	BLOCK NUMBER REQUEST	Returns the block number by a 6-digit number. The current address is returned during playback and the pause target address is returned during pause. "XXXXXX" is returned in park mode and "000000" is returned in the lead-in area.
? T	TIME CODE REQUEST	Returns the time code by a 4-digit number. The current address is returned during playback and the pause target address is returned during pause. "XXXX" is returned in park mode and "0000" is returned in the lead-in area.
? R	TRACK NUMBER REQUEST	Returns the track number by a 2-digit number. The current address is returned during playback and the pause target address is returned during pause. "XX" is returned in park mode. "00" is returned in the lead-in area and "AA" is returned in the lead-out area.
? I	INDEX NUMBER REQUEST	Simultaneously returns the track number and the index number by a 4-digit number. The current address is returned during playback and the pause target address is returned during pause. "XXXX" is returned in park mode, "0000" is returned in the lead-in area and "AA01" is returned in the lead-out area.
? A	ADDRESS REQUEST	Returns the track number, the index number and the P time by a 10-digit number. The current address is returned during playback and the pause target address is returned during pause. "XXXXXXXXXX" is returned in park mode, "0000000000" is returned in the lead-in area and "AA01000000" is returned in the lead-out area.
? Q	TOC INFORMATION	<p>Returns TOC data. When no track number is specified, the first track number, the last track number and the absolute time of the beginning of the lead-out area are returned by a 10-digit number.</p> <p>Example : 0109665544 01 : 1st track number 09 : Last track number 665544 : The lead-out area begins at 66 minutes 55 seconds 44 blocks.</p> <p>When a track number is specified, the absolute time of the beginning of the track and the code to indicate whether the track is an audio track or a data track are returned by an 8-digit number.</p> <p>Example : 10020000 100200 : Track 5 begins at 10 minutes 02 seconds 00 blocks. 00 : Track 5 is an audio track. (04 = data)</p>
? G	CATALOG CODE REQUEST	Returns the catalog code of the disc being played by a 13-digit number. If no catalog code is found or in home mode, thirteen Xs are returned.
? O	ISRC CODE REQUEST	Return ISRC code when ISRC code is written.
? P	PLAYER ACTIVE MODE REQUEST	<p>Returns operation mode by three characters.</p> <p>P00 : home mode (without magazine) P20 : home mode (with magazine) P01 : Park mode P04 : Play mode P06 : Pause mode</p>

Command Mnemonic	Command	Explanation
? K	DISC STATUS REQUEST	Returns the attribute of the playback disc in 8 characters (N1 – N8). N1 : Disc loading 0 : no 1 : yes N2 : Audio track 0 : none 1 : available X : unknown N3 : Data track 0 : none 1 : available X : unknown N4 : CDV 0 : no 1 : yes X : unknown N5 : CD – I 0 : no 1 : yes X : unknown N6 – N8 : (reserved) Example : 11000XXX
? X	CDP MODEL NAME REQUEST	Returns the model name of the CD player. "P152401"
? M	COMMUNICATION MODE REQUEST	Returns communication mode "3" with the DRM – 1804X.

5. Error Messages

Command Mnemonic	Command	Explanation
E00	COMMUNICATION ERROR	Communication line error <ul style="list-style-type: none"> ● Framing error ● Buffer overflow
E04	FEATURE NOT AVAILABLE	An unusable command has been executed. <ul style="list-style-type: none"> ● Different command mnemonics or mode
E06	MISSING ARGUMENT	Required parameter has not been specified.
E11	DISC NOT EXIST	No disc or no magazine has not been installed.
E12	ADDRESS ERROR	No search address has not been found.
E13	DEFOUSSING ERROR	De-focus has occurred.
E14	SPINDLE UNLOCK	The spindle has not been locked.
E16	INPUT OTHER DEVICE	The eject key had been depressed before the command execution was completed.
E90	MECHANICAL PANIC	An error which cannot be recovered has occurred in a mechanical operation such as loading and unloading.
E91	CAN'T EJECT MAGAZINE	The magazine cannot be extruded.
E92	CAN'T LOAD	Unsuccessful loading
E96	CAN'T SPINDLE UP	Unsuccessful start.
E99	PANIC	An error which cannot be recovered has occurred in random access mode. <ul style="list-style-type: none"> ● The playback operation cannot be continued and stops.

6. CD-ROM Status Chart



- Mode to return "R" when the command arrives
- Normal chart (normal transition)
- - - At reset
- . - Break by C/R, etc

1.5.3 ENTERING AGING MODE

After setting the magazine containing the necessary discs in place, turn ON DIP SW 5 and 6 located on the rear panel of the unit, and supply power to the unit. The aging operating mode can be selected with the SCSI ID number. Once aging has started, the SCSI ID number turns to 0, and all SCSI access returns to BUSY status.

● Terminating Aging Mode

The EJECT button is enabled even during aging. If it is pressed, the aging operation cannot be continued, and faulty results will be obtained.

To terminate aging mode, turn the DIP SW 5 to OFF. Once the player command in progress stops, aging will terminate normally. Also, once the number of operations set into the mode has been completed, aging will terminate normally. With normal termination, the magazine is ejected and operation stops.

● Confirming Operation During Aging

While aging is in progress, the front panel LED will function as follows.

BUSY LED : If normal, does not light up. If an error is detected, flashes at intervals of 0.5 sec.

MAGAZINE LOCKED : Flashes at intervals of 0.5 sec. if the error code can be read normally from the disc.
Does not flash if the error code cannot be read.

AUDIO LED : Lights up during play operation.

MAGAZINE INSERT : Does not light up.

INSERT

When aging is terminated due to an error, BUSY LED will flash at intervals of 0.5 sec., and the drive will maintain the error conditions for as long as possible.

● Contents of Aging Operation

No.	Description
0	Loads 1st to 18th disc and turns each servo ON.
1	Plays the inner 4 minutes and outer 4 minutes of the 1st, 9th, and 18th discs at quadruple speed. Repeats this cycle 50 times.
2	Repeats No. 1 cycle 200 times.
3	Plays the inner 4 minutes and outer 4 minutes of all discs (1st to 18th) at quadruple speed. Repeats this cycle 100 times.
4	Plays the 1st and 6th discs at quadruple speed from start to finish. Repeats this cycle perpetually.
5	Starts the 1st disc at quadruple speed, and perpetually repeats search of the innermost and outermost parts of the disc.
6	Repeats No. 0 operation 5,000 times.
7	Perpetually repeats loading cycle of No. 1 and No. 6 disc trays.

1.5.4 ADJUSTMENTS

Notes :

- If the specified values cannot be obtained or no adjustment is possible by performing the verifications or adjustments described in adjustment items 1–5, the pickup block may be defective.
- Adjustment is performed in Normal speed.

1. VCO Free-run Frequency Adjustment

● Objective	To optimize the VCO free-run frequency.		
● Symptom when out of adjustment	No play.		
● Measurement instrument connections	Connect the frequency counter to TP2, pin1 (PSER), TP2, pin2 (PLCK). [Settings]	● Player state ● Adjustment location ● Disc	Stopped (just the Power switch ON) VR7 (PLL OFFSET) L2 (VCO. ADJ) None needed
[Procedure] 1. Adjust VR7 so that the PLL offset voltage at TP2, pin1 is $0V \pm 0.1V$. 2. Verify the VCO frequency at TP2, pin2 is $4.32MHz \pm 0.01MHz$. 3. If it has shifted, adjust L2 to correct frequency.			

2. Focus Offset Adjustment

● Objective	Verify the DC offset for the focus error amp.		
● Symptom when out of adjustment	The model does not focus in and the RF signal is dirty.		
● Measurement instrument connections	Connect the oscilloscope to TP1, pin2 (FCS. ERR) [Settings] 5mV/division 10ms/division DC mode	● Player state ● Adjustment location ● Disc	Stopped (just the Power switch ON) VR3 (FCS. OFS) None needed
[Procedure] Adjust VR3 so that the voltage at TP1, pin2 is $0V \pm 50mV$.			

3. Grating Adjustment

<ul style="list-style-type: none"> ● Objective 	To align the 2 laser beam spots used for tracking error detection to the optimum angle on the track.		
<ul style="list-style-type: none"> ● Symptom when out of adjustment 	Play does not start. Track search is not possible. Skips tracks.		
<ul style="list-style-type: none"> ● Measurement instrument connections 	Connect the oscilloscope to TP1, pin4 (TRK.ERR) through a low-pass filter. (See Fig. 4.) [Settings]	<ul style="list-style-type: none"> ● Player state ● Adjustment location ● Disc 	Focus and spindle are closed in test mode, and tracking is open. Slit for adjusting the grating of the pickup LD component. YEDS-7

[Procedure]

1. Move the pickup to halfway across the disc.
2. Turn the focus and spindle servos ON in order.
3. Insert a flathead screwdriver into the grating adjustment slit, and find the null point by turning the LD.
4. Slowly turn the screwdriver clockwise past the null point, and align the grating with the point where the tracking error first reaches maximum.

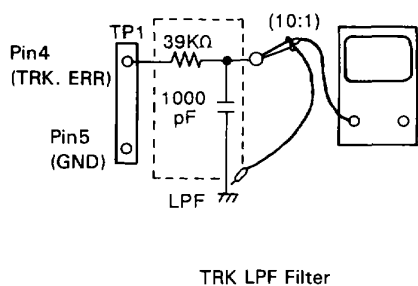


Fig. 4

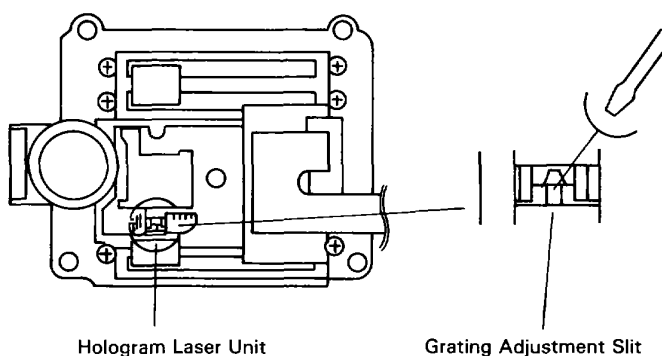


Fig. 5

(Reference)

The grating is aligned when the grating adjustment slit and the cut in the PU body form nearly a straight line.

4. Tracking Error Balance Adjustment

● Objective	To verify that there is no variation in the sensitivity of the tracking photo diode.		
● Symptom when out of adjustment	Play does not start or track search is impossible.		
● Measurement instrument connections	Connect the oscilloscope to TP1, pin4 (TRK. ERR). This connection may be via a low pass filter. (See Fig. 6.) [Settings] 50mV/division 5ms/division DC mode	● Player state ● Adjustment location ● Disc	Focus and spindle servos closed and tracking servo open VR1 (TRK. BAL) YEDS-7

[Procedure]

1. Move the pickup to halfway across the disc ($R = 35\text{mm}$).
2. Close the focus servo and the spindle servo.
3. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode.
4. Adjust VR1 so that the voltage at TP1, pin3 is $0V \pm 50\text{mV}$.

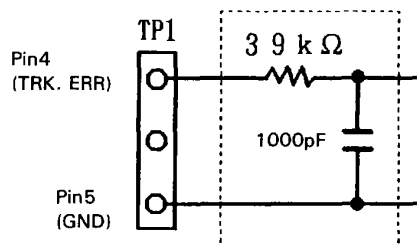


Fig. 6 TRK LPF Filter

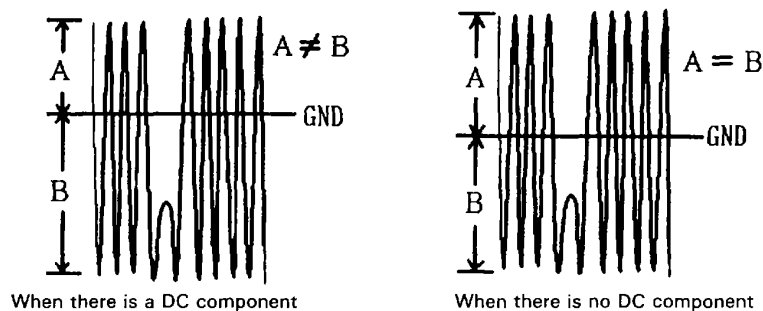


Fig. 7 DC Component Waveform

5. Pickup Radial / Tangential Adjustment

● Objective	To adjust the angle of the pickup relative to the disc so that the laser beams are shone straight down into the disc for the best read out of the RF signals.		
● Symptom when out of adjustment	Sound broken ; some discs can be played but not others.		
● Measurement instrument connections	Connect the oscilloscope to TP3, pin1 (RF). [Settings] 20mV/division 200ns/division AC mode	● Player state ● Adjustment location ● Disc	Play Pickup radial tilt adjustment screw and tangential tilt adjustment screw YEDS-7

[Procedure]

1. Move the pickup to halfway across the disc (R = 35mm). Close the respective servos and put the player into play mode.
2. First, adjust the radial tilt adjustment screw with a Phillips screwdriver so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly (Fig. 10).
3. Next, adjust the tangential tilt adjustment screw with a Phillips screwdriver so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly (Fig. 10).
4. Adjust the radial tilt adjustment screw and the tangential tilt adjustment screw again so that the eye pattern can be seen the most clearly. As necessary, adjust the two screws alternately so that the eye pattern can be seen the most clearly.
5. When the adjustment is completed, lock the radial and tangential adjustment screw.

Note : Radial and tangential mean the directions relative to the disc shown in Fig. 8.

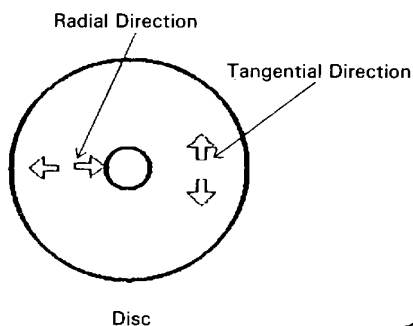


Fig. 8

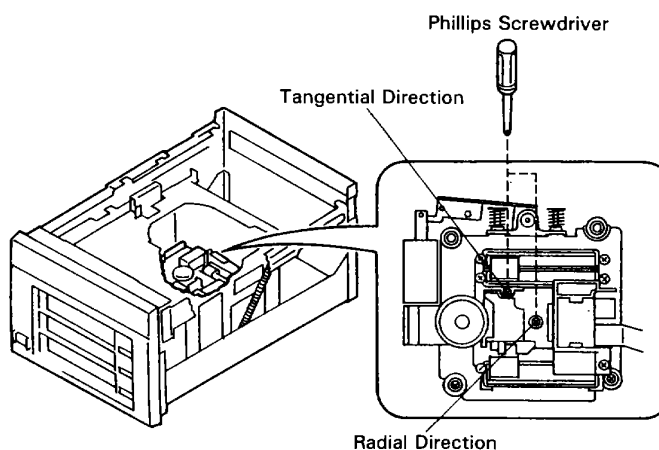
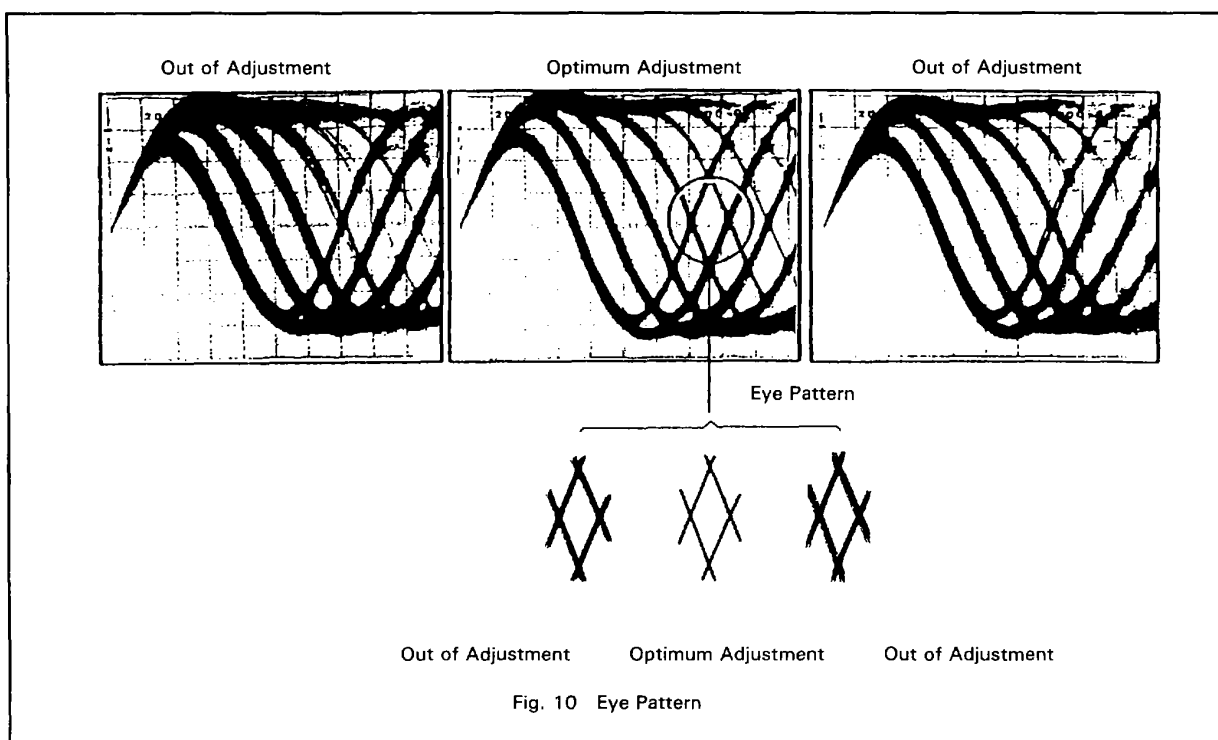


Fig. 9 Adjustment Locations



6. RF Level Verification

● Objective	To verify the playback RF signal amplitude.		
● Symptom when out of adjustment	No paly or no search.		
● Measurement instrument connections	Connect the oscilloscope to TP3, pin1 (RF). [Settings] 50mV/division 10ms/division AC mode	● Player state ● Adjustment location ● Disc	Play VR5 YEDS-7
<p>[Procedure]</p> <ol style="list-style-type: none"> 1. Move the pickup to halfway across the disc (R = 35mm). 2. Close the respective servos and put the player into play mode. 3. Verify the RF signal amplitude is $1.7V_p - p \pm 0.6V$. 4. If it was over $2.1V_p - p$, adjust VR5 so that the voltage is $2.0V_p - p \pm 0.1V$. 			

7. Focus Servo Loop Gain Adjustment

● Objective	To optimize the focus servo loop gain.		
● Symptom when out of adjustment	Playback does not start or focus actuator noisy.		
● Measurement instrument connections	See Fig. 11.	● Player state	Play
	[Settings] CH1 : 20mV/division CH2 : 5mV/division X-Y mode	● Adjustment location	VR4 (FCS. GAN)
		● Disc	YEDS-7

[Procedure]

1. Set the AF generator output to 1kHz and 1Vp-p.
2. Move the pickup to halfway across the disc (R = 35mm).
3. Close the respective servos and put the player into play mode.
4. Adjust VR4 so that the Lissajous waveform is symmetrical (phase difference is $90^\circ \pm 10^\circ$) about the X axis and the Y axis.

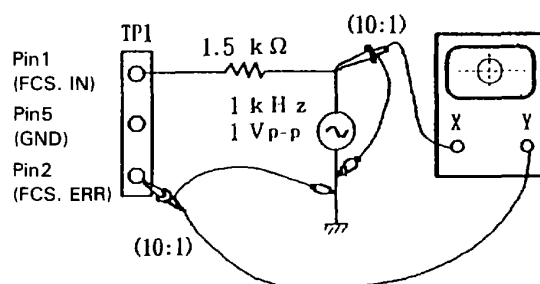
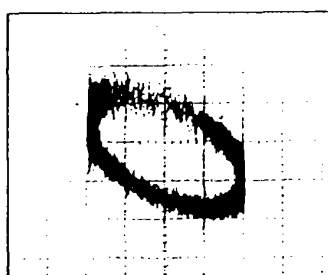
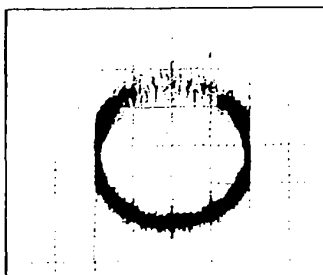


Fig. 11 Connection

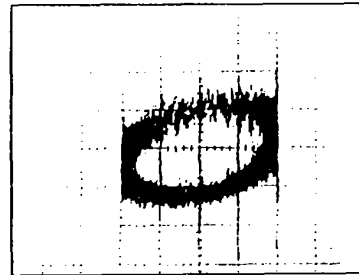
Focus Gain Adjustment



Higher Gain



Optimum Gain



Lower Gain

Fig. 12 Lissajous Waveform

8. Tracking Servo Loop Gain Adjustment

● Objective	To optimize the tracking servo loop gain.		
● Symptom when out of adjustment	Playback does not start, during searches the actuator is noisy, or tracks are skipped.		
● Measurement instrument connections	See Fig. 13.	● Player state	Play
	[Settings] CH1 : 50mV/division CH2 : 20mV/division X-Y mode	● Adjustment location	VR2 (TRK. GAN)
		● Disc	YEDS- 7

[Procedure]

1. Set the AF generator output to 1kHz and 1Vp-p.
2. Move the pickup to halfway across the disc (R = 35mm).
3. Close the respective servos and put the player into play mode.
4. Adjust VR2 so that the Lissajous waveform is symmetrical (phase difference is $90^{\circ} \pm 10^{\circ}$) about the X axis and the Y axis.

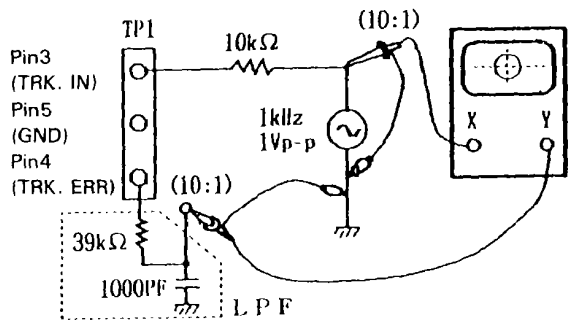
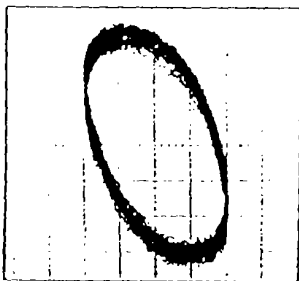
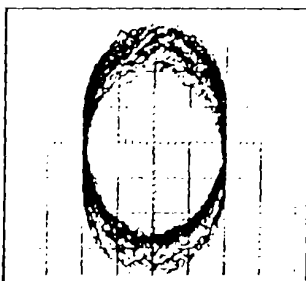


Fig. 13 Connection

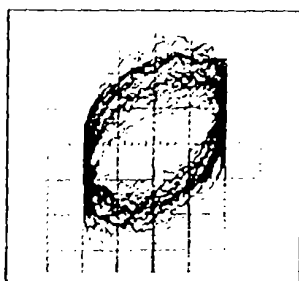
Tracking Gain Adjustment



Higher Gain



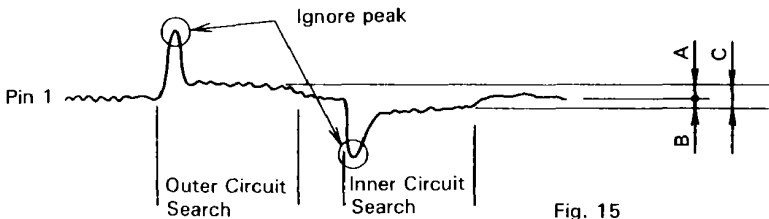
Optimum Gain



Lower Gain

Fig. 14 Lissajous Waveform

9. VCO Free-run Frequency Re-adjustment


● Objective	To optimize the VCO free-run frequency.		
● Symptom when out of adjustment	No play. Search does not converge.		
● Measurement instrument connections	Connect the oscilloscope to TP2, pin1 (PSER). [Settings] 0.5V/division 1ms/division	● Player state ● Adjustment location ● Disc	Play L2 (VCO. ADJ) VR6 (×4 VCO. ADJ) YEDS-7
<p>[Procedure]</p> <ol style="list-style-type: none"> 1. Perform a search of inner and outer circuits in Normal-speed play, and adjust L2 so that the DC component amplitude of the TP2, pin1 (PSER) waveforms oscillates uniformly up and down. 2. Perform a search of inner and outer circuits in quadruple-speed play, and adjust VR7 so that the DC component amplitude of the TP2, pin1 (PSER) waveforms is as small as possible and oscillates uniformly up and down. 			
 <p style="text-align: center;">Fig. 15</p> <p style="text-align: right;">C : MIN A ≐ B</p>			
<p>Note : Inner/outer circuit search can be performed by pressing [TIME] on the remote control unit, and then pressing [SEARCH] in succession.</p>			

10. Tracking Error Balance Re-adjustment


● Objective	To verify that there is no variation in the sensitivity of the tracking photo diode.		
● Symptom when out of adjustment	Play does not start or track search is impossible.		
● Measurement instrument connections	Connect the oscilloscope to TP1, pin4 (TRK. ERR). This connection may be via a low pass filter. (See Fig. 6.) [Settings] 50mV/division 5ms/division DC mode	● Player state ● Adjustment location ● Disc	Focus and spindle servos closed and tracking servo open VR1 (TRK. BAL) YEDS-7
<p>[Procedure]</p> <ol style="list-style-type: none"> 1. After "8. Tracking Servo Loop Gain Adjustment" has been completed, adjust to 0V ±50mV, using the same method as that of the "4. Tracking Error Balance Adjustment". 			

1.6 PARTS LIST FOR PACKING AND EXPLODED VIEWS

NOTES :

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

(1) PACKING

Mark	No.	Description	Parts No.
 NSP	1	POWER CORD WITH PLUG	DDG1028
	2	FOLLOW CARD BAG	DHL1011
	3	POWER CAP	DNK2839
	4	INSTALLATION MANUAL (English, French, German, Italian, Spanish)	DRC1010
	5	LABEL (PAPER)	DRW1155
NSP	6	FOLLOW UP CARD	DRY1032
	7	CORD WITH PLUG	VDE - 055
	8	POLYETHYLEN BAG	Z21 - 014
	9	POLYETHYLEN BAG	Z21 - 016
	10	POLYETHYLEN BAG	Z21 - 019
	11	PROTECTOR	DHA1292
	12	PLATE	DHC1039
	13	PACKING CASE	DHG1546
	14	ACCESSORIES CASE	DHG1564
	15	PACKING SHEET	DHL1022
	16	CAUTION LABEL	VRM1044
	17	MAGAZINE ASSY	DXA1106

(2) EXTERIOR

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
A	1	PWRB ASSY	DWR1133		51	EJECT BUTTON	DNK2830
	2	ROMB ASSY	DWG1383		52	FRONT PANEL ASSY	DXA1656
	3	SRVB ASSY	DWS1198		53	DOOR SPRING	PBH1022
	4	HPNB ASSY	DWF1005		54	SCREW	BBT30P060FNI
	5	FRPB ASSY	DWX1363		55	SCREW	BBZ30P060FMC
	6	EJSB ASSY	DWS1196		56	SCREW	BBZ30P100FZK
	7	IDSB ASSY	DWS1194		57	SCREW	BMZ30P040FMC
	8	JCKB ASSY	DWX1364		58	SCREW	CBZ30P080FZK
	9	SCSIB ASSY	DWX1366		59	SCREW	FBT40P080FNI
	10	INSULATION SLEEVE	DDM1002		60	SCREW	IBZ30P060FMC
A	11	FERRITE CORE	DTH1166		61	SCREW	IPZ30P080FMC
	12	EARTH CODE ASSY	DDX1146		62	SCREW	PMA30P060FMC
	13	GROUND TERMINAL	DKE - 102		63	SCREW	PMB40P080FMC
	14	CONNECTOR ASSY 4P	DKP2675		64	SCREW	PMZ30P100FNI
	15	CONNECTOR ASSY	DKP2856		65	DOOR ASSY - S	DXX2150
A	16	LINE FILTER WITH INLET	DTF1078	NSP	66	DOOR PLATE	DAM1063
	17	CONNECTOR ASSY 4P	PA04PP2C52	NSP	67	DOOR	DNK2829
	18	CONNECTOR ASSY 6P	PA06PP4C52		68	Programed IC to M5M27C256AK (IC35)	DYW1357
	19	CONNECTOR ASSY 7P	PA07PP2R20		69	Programed to IC M5M27C256AK (IC36)	DYW1358
	20	CONNECTOR ASSY 9P	PA09PP R62		70	TRANS LABEL	DRW1564
NSP	21	3 MAGAZINE MECHANISM ASSY	DXB1481		71	CAUTION LABEL	DRW1455
	22	JOINT CAP	DEB1057		72	WARNING LABEL	DRW1533
	23	FLEXIBLE CUSHION B	DEB1142			(MOVING DRIVE)	
	24	EDGE GUARD	DEC1155		73	IBM LABEL	DRW1566
	25	PCB HOLDER	DEC1231		74	65 LABEL	ORW1069
					75	CAUTION LABEL	ORW1129
	26	F CLAMP HOLDER	DEC1266				
	27	WIRE SADDLE	DEC1299		76	
	28	PROTECT SHEET	DEC1601		77	CAUTION LABEL HE	PRW1233
	29	CUSHION	DEC1212		78	
NSP	30	INSULATION SHEET	DEC1786		79	
					80	TRANS LABEL	VRW1105
	31	FELT LEG	DED - 102				
	32	PSW JOINT	DLA1564				
	33	BASE CHASSIS	DNA1154				
	34	REAR PANEL	DNC1338				
	35	FRONT STAY	DND1145				
	36	PCB STAY	DND1146				
	37	BONNET	DNE1238				
	38	BOTTOM PANEL	DNE1239				
NSP	39	JACK HOLDER	DNF1411				
	40	SWITCH HOLDER	DNF1418				
	41	BRIDGE	DNF1447				
	42	SIDE STAY	DNF1448				
	43	PSW BUSH	DNK1326				
	44	PSW CAP	DNK2413				
	45	SHAFT HOLDER	DNK2414				
	46	TAPE (G)	REH1010				
	47	BRIDGE CUSHION	VEC1387				
	48	POWER BUTTON SPRING	DBH1213				
49	VOLUME KNOB	DNK1664					
50	POWER BUTTON	DNK2411					

(3) 3 MAGAZINE MECHANISM ASSY

Mark	No.	Description	Parts No.
	1	FERRITE CLAMP	DTH1168
	2	SCREW	DBA1023
	3	SENSOR SPRING	DBH1102
	4	CONNECTOR ASSY 2P	DKP2812
	5	CONNECTOR ASSY 2P	DKP2813
	6	CONNECTOR ASSY 3P	DKP2815
	7	ROLLER	DLA1286
	8	TIMING BELT	DMS1027
	9	MAIN CHASSIS	DNA1137
	10	LINK L	DNH1296
	11	LINK R	DNH1297
	12	GEAR ANGLE	DNH1844
	13	MOTOR STAY	DNH1847
	14	EJECT BASE	DNH1848
	15	SENSOR PLATE	DNK1567
	16	SENSOR HOLDER	DNK1576
	17	WORM PULLEY	DNK2825
	18	WORM WHEEL	DNK2826
	19	SYNCHRONIZE GEAR	DNK2827
	20	LEVER GEAR	DNK2833
	21	GEAR EF	DNS1081
	22	LEVER SWITCH	DSK1003
	23	SCREW (BS)	PBA1051
	24	SCREW (STEEL)	PBA1059
	25	SCREW (STEEL)	PBH1116
	26	SYNCHRONIZE SHAFT (FE)	PLA1085
	27	LINK PLATE (FE)	PNA1698
	28	CORD HOLDER (STEEL)	RNH-184
	29	DUMP SHEET	VEX1021
	30	HARNESS SHEET	VEX1022
	31	SCREW	BBZ30P080FMC
	32	SCREW	BMZ26P050FMC
	33	SCREW	BSZ26P040FMC
	34	SCREW	PMZ20P030FMC
	35	WASHER	WT26D047D050
	36	WASHER	WT31D054D050
	37	WASHER	WT41D065D050
	38	MOTOR ASSY	DEA1005
NSP	39	MOTOR PULLEY	DNK1580
NSP	40	MOTOR	PXM1002
	41	MOTOR ASSY	PEA1249
NSP	42	WORM	PNW1220
NSP	43	MOTOR	PXM1002
	44	CAUTION LABEL	PRW1018
	45	CAUTION LABEL (G)	VRW-329
	46	CAUTION LABEL	VRW1094

(4) SUB CHASSIS FULL ASSY

Mark	No.	Description	Parts No.
NSP	1	SENSOR BOARD ASSY	DWM1395
NSP	2	SERVO MECHANISM ASSY	DXB1482
	3	CORD HOLDER (STEEL)	RNH-184
	4	FLOAT SCREW	DBA1048
	5	FLOAT SPRING F	DBH1208
	6	FLOAT SPRING R	DBH1209
	7	LEVER SPRING	DBH1237
	8	FLOAT RUBBER	DEB1203
	9	PLUNGER BASE	DNH1676
	10	LOCK ARM	DNH1792
	11	UPPER CHASSIS	DNH1845
	12	HOLDER CAM	DNK2824
	13	SOLENOID	DXP1031
	14	SCREW (STEEL)	PBA-125
	15	CUSHION A	PED1001
	16	DISC HOLDER (ABS)	PNW1924
	17	HOLDER LEVER (ABS)	PNW1925
	18	DUMP SHEET (STEEL)	VEX1021
	19	SCREW	BSZ26P040FMC
	20	SCREW	PMA26P040FMC
	21	SCREW	PMB30P050FMC
	22	WASHER	WT26D047D025
	23	SCREW	DBA1054
	24	LOCK SPRING	DBH1207
NSP	25	PLASTIC RIVET	PBM1001
	26	GUIDE SHAFT	DLA1530
	27	SHIELD CASE	DNH1677
	28	SLIT PLATE	DNH1712
	29	PLATE	DNH1713
	30	CARRIAGE BASE	DNK2401
	31	FPC HOLDER	DNK2402
	32	LOCK TEETH	DNK2405
	33	TABLE MAGNET	DNS1145
	34	SPINDLE MOTOR	DXM1051
	35	DRIVE UNIT	DXP1029
	36	SPEED DETECT UNIT	DXP1030
	37	RUBBER RING	PEB1097
	38	SCREW C	VBA1014
	39	SCREW	APZ30P080FMC
	40	SCREW	BMZ20P040FMC
	41	SCREW	BPZ30P100FMC
	42	SCREW	IPZ30P060FMC
	43	SCREW	JFZ20P040FMC
	44	WASHER	WA42N100W050
	45	SCREW	ZMD26M060FBT
	46	PICKUP ASSY-S	DXX2154
	47	DISC TABLE ASSY-S	DXX1981
NSP	48	DISC TABLE	DLA1555
NSP	49	HIGHT PLATE	DNK2406
NSP	50	TABLE SHEET	DEC1484
	51	CONNECTOR ASSY 13P	DKP2810
NSP	52	HEAD ASSY	DWY1022
NSP	53	POSS ASSY	DWX1280
	54	PU FLEXIBLE CABLE	DNP1556

(5) SUB CHSSIS ASSY

Mark	No.	Description	Parts No.
	1	CORD HOLDER (STEEL)	RNH - 184
	2	CLAMPER SPRING B	DBH1120
	3	CLAMPER SPRING	DBH1206
	4	BELT	DEB1253
	5	CONNECTOR ASSY 5P	DKP2811
	6	CLAMPER HUB	DLA1528
	7	HOLDER PLATE	DNH1294
	8	SUB CHASSIS	DNH1846
	9	MAIN GEAR	DNK1568
	10	GEAR A	DNK1569
	11	GEAR B	DNK1570
	12	DRIVE LEVER	DNK1571
	13	DRIVE PLATE	DNK1572
	14	CLAMPER LEVER	DNK1573
	15	ROTARY LEVER	DNK1577
	16	CLAMPER	DNK2407
	17	CLAMPER CAM	DNK2823
	18	CLAMPER HOLDER B	DNK2831
	19	LEVER SWITCH	DSK1003
	20	SCREW (STEEL)	PBA - 125
	21	CLAMPER SPRING T	PBH1016
	22	TENTION SPRING	PBH1123
	23	SPRING (STEEL)	PBH1124
	24	STEEL BALL	PBP - 001
	25	RUBBER BUSH	PEB1030
	26	SPACER (PVC)	PNW1139
	27	GEAR PULLEY	PNW1095
	28	CLAMPER HOLDER T (PLASTIC)	PNW1107
	29	SCREW	BMZ26P050FMC
	30	SCREW	BSZ26P040FMC
	31	SCREW	PMZ20P030FMC
	32	WASHER	WA31D054D025
	33	WASHER	WT26D047D013
	34	WASHER	WT26D047D025
	35	WASHER	WT31D054D013
	36	WASHER	WT41D065D050
	37	E RING JE - 2.5	Z39 - 010
	38	MOTOR ASSY	PEA1250
NSP	39	MOTOR PULLEY	PLB - 283
NSP	40	MOTOR	PXM1002

(6) GUIDE FULL ASSY

Mark	No.	Description	Parts No.
NSP	1	MECHANISM BOARD ASSY	DWM1394
	2	HOLDER SPRING	DBK1028
	3	CONNECTOR ASSY 2P	DKP2814
	4	EJECT PLATE	DNK2834
	5	PLATE HOLDER	DNV1022
	6	SM SPRING	PBH1015
	7	LOCK SPRING (SUS)	PBH1117
	8	EJECT SPRING (STEEL)	PBH1130
	9	SPACER (RUBBER)	PEB1192
	10	GUIDE BAR (FE)	PLA1086
	11	EJECT LEVER (FE)	PNB1277
	12	SM SELECT (SUS)	PNB1305
NSP	13	WORM	PNW1220
	14	TOP GUIDE (ABS)	PNW1951
	15	CENTER GUIDE (ABS)	PNW1952
	16	BOTTOM GUIDE (ABS)	PNW1953
	17	SIDE GUIDE L (ABS)	PNW1954
	18	SIDE GUIDE R (ABS)	PNW1955
	19	LOCK LEVER (POM)	PNW1956
	20	SYNCHRONIZE GEAR (ABS)	PNW1958
	21	WORM CAM (POM)	PNW1961
	22	SWITCH LEVER A (ABS)	PNW1964
	23	SWITCH LEVER B (ABS)	PNW1965
	24	DRIVE SHAFT (POM)	PNW1969
NSP	25	MOTOR	PXM1002
	26	SCREW	BBZ30P080FMC
	27	SCREW	BBZ20P060FMC
	28	SCREW	BPZ20P080FZK
	29	WASHER	WT26D047D013

1.7 PCB PARTS LIST

NOTES :

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560 Ω \rightarrow 56 \times 10¹ \rightarrow 561 RD1/8PM $\begin{bmatrix} 5 & 6 & 1 \end{bmatrix}$ J

47k Ω \rightarrow 47 \times 10³ \rightarrow 473 RD1/4PS $\begin{bmatrix} 4 & 7 & 3 \end{bmatrix}$ J

0.5 Ω \rightarrow 0R5 RN2H $\begin{bmatrix} 0 & R & 5 \end{bmatrix}$ K

1 Ω \rightarrow 010 RS1P $\begin{bmatrix} 0 & 1 & 0 \end{bmatrix}$ K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω \rightarrow 562 \times 10¹ \rightarrow 5621 RM1/4PC $\begin{bmatrix} 5 & 6 & 2 & 1 \end{bmatrix}$ F

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
LIST OF ASSEMBLIES							
NSP	MAINB ASSY		DWM1357		IC45		NCR53C90A-68PL
	HPNB ASSY		DWF1005		IC25, IC5		NJM2058M
	ROMB ASSY		DWG1383		IC30		NJM2060M
	IDSB ASSY		DWS1194		IC28, IC6		NJM4558M
	EJSB ASSY		DWS1196		IC24		PD4379C
	SRVB ASSY		DWS1198		IC40		PD4380B
	FRPB ASSY		DWX1363		IC29		TC4052BF
	JCKB ASSY		DWX1364		IC13-IC16, IC50		TC4S66F
	SCSIB ASSY		DWX1366				
	PWRB ASSY		DWR1133		IC38		TC74AC138F
					IC39		TC74AC139F
					IC52		TC74AC157F
					IC53		TC7S32F
					IC33		UPD70325L-10
NSP	3 MAGAZINE MECHANISM ASSY		DXB1481		Q11-Q14, Q20		2SA1037K
NSP	MECHANISM BOARD ASSY		DWM1394		Q23, Q24, Q34		2SC2412K
NSP	SENSOR BOARD ASSY		DWM1395		Q27, Q28		DT5A124E
NSP	SERVO MECHANISM ASSY		DXB1482		Q25		DTA124EK
NSP	P. U. ASSY		DXX2154		Q22, Q26		DTC124EK
NSP	PCKB ASSY		DWM1280				
NSP	POSS ASSY		DWX1280		D2		DAP202K
NSP	HEAD ASSY		DWY1022		D3		KV1420
HPNB ASSY				COILS AND FILTERS			
COILS AND FILTERS					F12, F14, F15, F3-F8		DTH1122
	F601, F604		DTH1153		F11		DTH1153
CAPACITORS					L4		DTH1163
	C601, C602		CKSQYF103Z50		L2 (1UH)		DTL1002
RESISTORS					L10-L29, L5-L9		OTL1040
	VR601 (5K-B, 0.05W)		DCS1021		L3 (20MHZ)		PTF1016
OTHERS					F16		VTH1016
	CN35		B4B-PH-K-Y	CAPACITORS			
	J8, J9		DDX1140		C192, C193		CCSQCH101J50
	JA601		RKN-098		C150, C151		CCSQCH150J50
ROMB ASSY					C123, C124		CCSQCH220J50
SEMICONDUCTORS					C100, C101		CCSQCH221J50
	IC21		CXD1095Q		C104		CCSQCH330J50
	IC27		LC7883KM		C110		CCSQCH470J50
	IC44		M51957AL		C138, C139		CCSQL471J50
	IC43		MB81C78A-35PF		C208		CEAL010M50
	IC42		MB81C81A-35PJ		C126, C143, C144, C169, C180		CEAL100M16
					C184, C199, C206, C209-C212		CEAL100M16
	IC41		MB841000-10SLPF		C92		CEAL100M16
	IC34		MB84256A-70LLPF		C129, C204		CEAL101M6R3
					C132, C133, C135, C136		CEAL220M16

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
	C141, C142 C207		CEAL220M16 CEAL220M6R3	SENSOR BOARD ASSY			
	C105 C74 C75 C177 C111, C112, C76, C77		CEAL3R3M50 CEALNP010M50 CEALNP100M16 CKSQYB102K50 CKSQYB103K50	SEMICONDUCTORS			
	C80, C81 C78 C107 C113 C137, C140, C79		CKSQYB182K50 CKSQYB222K50 CKSQYB332K50 CKSQYB562K50 CKSQYB821K50	Q901			
	C102, C103, C114 – C116, C125 C127, C128, C130, C131, C134 C145, C161, C163 – C168 C172 – C176, C179, C181 C190, C191, C196, C205, C94		CKSQYF473Z50 CKSQYF473Z50 CKSQYF473Z50 CKSQYF473Z50 CKSQYF473Z50	GP1A52HR			
	C108		CKSYF474Z50	SWITCHES AND RELAYS			
RESISTORS	VR6 VR7 R296 R197, R198 R222, R297		VRTB6VS104 VRTB6VS473 RA4T103J RA5T223J RA8T103J	S901			
	R184, R187, R317, R319, R322 R326 R320, R325 R321, R324 R318, R323		RS1/10S103F RS1/10S103F RS1/10S183F RS1/10S472F RS1/10S563F	DSG1016			
	Other Resistors		RS1/10S□□□J	CAPACITORS			
OTHERS	CN31 MT CONNECTOR 3P CABLE HOLDER 9P CABLE HOLDER 11P CABLE HOLDER 13P CN15 JUMPER CONNECTOR 8P (2MMP) CN23, CN24 JUMPER CONNECTOR 10P (2MMP) CN32 TOP POST 3P CN9 CONNECTOR POST CN11 CONNECTOR POST CN7 TOP POST 14P (NH) J6 9P JUMPER WIRE (2MMP) J5, J7 11P JUMPER WIRE (2MMP) J4 13P JUMPER WIRE (2MMP) X3 X2 (17.0000MHZ) X1 (16.9344MHZ) IC SOCKET (28P)		173981 – 3 51048 – 0900 51048 – 1100 51048 – 1300 52147 – 0810 52147 – 1010 B3P – SHF B4B – PH – K – R B4B – PH – K – Y B4P – SHF D20PDY0915G D20PDY1120G D20PDY1325G DSS1029 DSS1056 PSS1008 VKH1001	C901			
				CEJA100M16			
				RD1/6PM□□□J			
				OTHERS			
				J952 CONNECTOR ASSY 4P			
				P. C. B. (XPC)			
				DKP2816			
				DNP1625			
				PWRB ASSY			
				SEMICONDUCTORS			
				△ IC201 (ICP – N25)			
				△ IC202, IC203 (ICP – N38)			
				△ Q101			
				△ Q102, Q103			
				RESISTORS			
				△ R102 (1.8/5W)			
				△ R108 (0.22/1W)			
				OTHERS			
				△ F101 (2.5A/250V)			
				△ F102 (2.5A/250V)			
				DCN1029			
				DCN1030			
				DEK1056			
				DEK1057			
				IDSB ASSY			
				SWITCH			
				S602			
				DSX1026			
				OTHERS			
				J404 CONNECTOR ASSY 4P			
				DKP2669			
				EJSB ASSY			
				SWITCHES			
				S604 – S606			
				RSX1030			
				OTHERS			
				CN33 CONNECTOR POST			
				S4B – PH – K – R			
				SRVB ASSY			
				SEMICONDUCTORS			
				IC31			
				IC23			
				IC1			
				IC3			
				IC2			
				IC601, IC602			
				IC54, IC55			
				IC20, IC8			
				IC4			
				IC9			
				IC7			
				IC10 – IC12, IC17 – IC19, IC26			
				IC22			
				Q21, Q5			
				Q10, Q607 – Q609			
				LA6517M			
				NJM082M			
				NJM2060M			
				NJM2901M			
				NJM311M			
				NJM4556M – B			
				NJM4558M			
				NJM4560M			
				PM3003A			
				TA8449P			
				TC4052BF			
				TC4S66F			
				TC74HCU04AF			
				2SA1037K			
				2SB1185 – F8			
				MECHANISM BOARD ASSY			
				SWITCHES			
				S953, S956, S958			
				S951, S952			
				S954, S955, S957			
				OTHERS			
				J951 CONNECTOR ASSY 9P			
				P. C. B. (XPC)			
				DKP2671			
				DNP1624			

Mark	No.	Description	Parts No.
	Q15–Q17		2SC2223
	Q35		2SC2412K
	Q1, Q32		2SD1614
	Q604–Q606, Q9		2SD1762–F8
	Q2, Q33, Q37, Q40, Q6		DTA124EK
	Q18, Q19, Q3, Q31, Q36		DTC124EK
	Q38, Q39, Q4, Q7, Q8		DTC124EK
	D10–D12, D6, D8		DA119
	D1		MTZJ4.3B
	D7, D9		RB100A
COILS AND FILTERS			
	F1, F2		DTH1122
RELAYS			
	RY1–RY3		DSR1009
CAPACITORS			
	C16, C91		CCSQCH100D50
	C52		CCSQCH101J50
	C86		CCSQCH121J50
	C34		CCSQCH221J50
	C88		CCSQCH271J50
	C93		CCSQCH331J50
	C18		CCSQSL391J50
	C28		CCSQSL471J50
	C87		CCSQSL681J50
	C106, C14, C15, C170, C171		CEAL100M16
	C35, C36, C39, C40		CEAL100M16
	C46, C47, C59, C604, C605		CEAL100M16
	C62, C64, C82		CEAL101M6R3
	C1, C11, C12, C3, C5		CEAL101M6R3
	C85, C90		CEAL101M6R3
	C30–C33		CEAL220M16
	C25		CEAL220M6R3
	C120		CEAL2R2M50
	C7, C9		CEAL470M16
	C606–C608, C71		CEALNP010M50
	C121, C72		CEALNP100M16
	C60		CEALNP220M16
	C70		CEALNP3R3M25
	C37, C58		CEALNP470M6R3
	C56		CEALNPR47M50
	C51, C69		CFTXA103J50
	C119, C42, C50		CFTXA104J50
	C68		CFTXA154J50
	C41		CFTXA183J50
	C117		CFTXA222J50
	C73		CFTXA224J50
	C118		CFTXA332J50
	C54, C66		CFTXA473J50
	C53, C55, C67		CFTXA683J50
	C122, C17, C26		CKSQYB102K50
	C19, C61, C83		CKSQYB103K50
	C22, C49		CKSQYB152K50
	C613–C619		CKSQYB221K50
	C57		CKSQYB472K50
	C38		CKSQYB681K50
	C45		CKSQYF153Z50
	C95		CKSQYF223Z50
	C186		CKSQYF333Z50
	C10, C13, C146, C147, C187		CKSQYF473Z50
	C194, C195, C197, C198, C2		CKSQYF473Z50
	C20, C200–C203, C21		CKSQYF473Z50
	C213, C214, C23, C24, C27		CKSQYF473Z50

Mark	No.	Description	Parts No.
	C29, C4, C43, C44, C6		CKSQYF473Z50
	C63, C65, C8, C84, C89		CKSQYF473Z50
	C98, C99		CKSQYF473Z50
	C48		CKSQYF683Z50
	C96, C97		CKSYF474Z50
RESISTORS			
	VR1, VR2		VRTB6VS103
	VR4		VRTB6VS472
	VR3		VRTB6VS473
	R29, R308		RD1/2PM2R7J
	R25		RD1/2PM4R7J
	Other Resistors		RS1/10S□□□J
OTHERS			
	CN21 MT CONNECTOR 2P		173981–2
	CN4 MT CONNECTOR 5P		173981–5
	CN20 AMP CONNECTOR 2P		2–173981–2
	CN6 AMP CONNECTOR 2P		4–173981–2
	CN27 9P JUMPER CONNECTOR (2MMP)		52147–0910
	CN26, CN30 11P JUMPER CONNECTOR (2MMP)		52147–1110
	CN25 13P JUMPER CONNECTOR (2MMP)		52147–1310
	CN1 FLEXIBLE CONNECTOR		5597–23APB
	CN19 CONNECTOR POST		B2B–PH–K
	CN8 TOP POST 3P		B3P–SHF
	CN3		B5P–SHF
	NYLON RIVET		DEC–117
	HEAT SINK		DNG1053
	CN406 CONNECTOR 11P		W–P7513#11
POSS ASSY			
SEMICONDUCTORS			
	IC2		GPIA30R
CAPACITORS			
	C20		CKSQYF473Z50
RESISTORS			
	All Resistors		RS1/10S□□□J
OTHERS			
	CN103 FLEXIBLE CONNECTOR		52207–0490
FRPB ASSY			
SEMICONDUCTORS			
	Q601–Q603, Q610		DTC124EK
	D604		GL3HS43
	D601–D603, D605		GL3KG43
CAPACITORS			
	C603		CKSQYF103Z50
RESISTORS			
	All Resistors		RS1/10S□□□J
OTHERS			
	CN34		S6B–PH–K–Y
JCKB ASSY			
OTHERS			
	JA602 PIN JACK 2P		DKB1013
	J403 CONNECTOR ASSY 4P		DKP2792
	SHIELD CASE (RCA)		DNF1431

Mark	No.	Description	Parts No.
SCSIB ASSY			
SEMICONDUCTORS			
	IC32		MC34268D
	IC37		MCCS142235DW
	D4, D5		RB100A
SWITCHES			
	S1		DSX1034
	S2		RSH1017
CAPACITORS			
	C148, C149	(22UF/16V)	RCH1085
RESISTORS			
	R295		RA6T103J
	Other Resistors		RS1/10S□□□J
OTHERS			
	1		51048-0800
	2, 3		51048-1000
	J1		D20PDY0810G
	J2, J3		D20PDY1010G
	J10, J11		DDX1140
	CN12, CN13		OKP1023
	PCB BINDER		VEF1040
HEAD ASSY			
SEMICONDUCTORS			
	IC1		NJM2060M
	Q2-Q4		2SC2223
	Q1		2SK2172D
CAPACITORS			
	C12, C13		CCSQCH040C50
	C9		CCSQCH050C50
	C10, C11		CCSQCH220J50
	C2-C4		CCSQSL561J50
	C5		CKSQYB103K50
	C21		CKSQYF104Z25
	C1, C16, C17, C7		CKSQYF473Z50
	C8 (3.3UF/35V)		DCH1050
	C14, C15, C18 (47UF/6.3V)		RCH1070
	C6 (1UF/50V)		RCH1075
RESISTORS			
	VR5		RCP1085
	Other Resistors		RS1/10S□□□J
OTHERS			
	CN101	FLEXIBLE CONNECTOR	52207-1990

Service Manual

ORDER NO.
RRZ1022

The chapter 1 of this Service Manual will not be reprinted. On your additional orders, we may supply only the chapter 2. For the chapter 1, please make copies and attach to the chapter 2 at your side if necessary.

CD-ROM CHANGER

DRM-1804X

CHAPTER 2

CONTENTS

CHAPTER 2

2.1 PACKING AND EXPLODED VIEWS	2-2
2.2 SCHEMATIC AND PCB CONNECTION DIAGRAMS	2-13

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan

PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.

PIONEER ELECTRONICS OF CANADA, INC. 300 Allstate Parkway Markham, Ontario L3R 0P2 Canada

PIONEER ELECTRONIC [EUROPE] N.V. Haven 1087 Keetberglaan 1, 9120 Melsele, Belgium

PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911

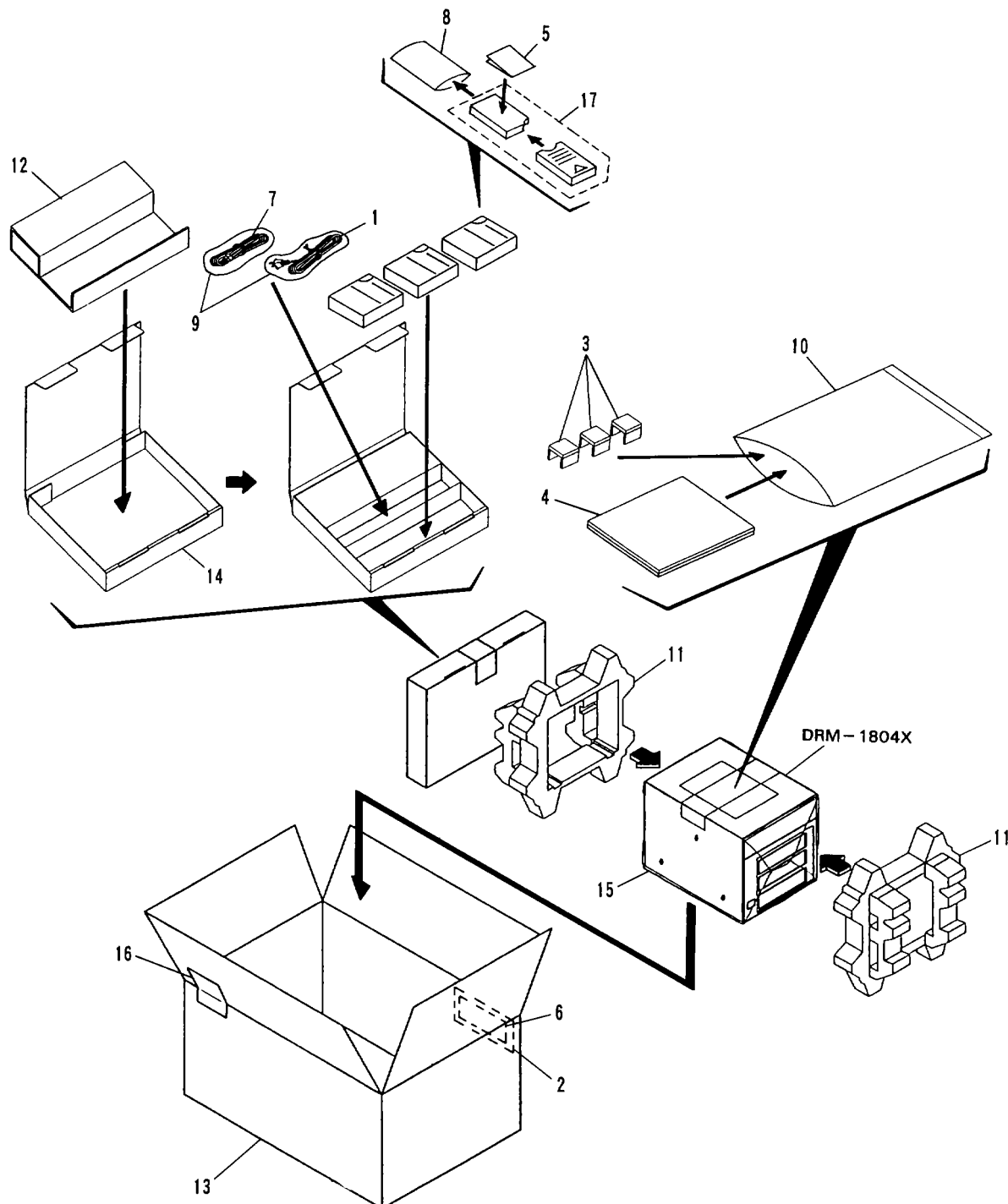
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CHAPTER 2

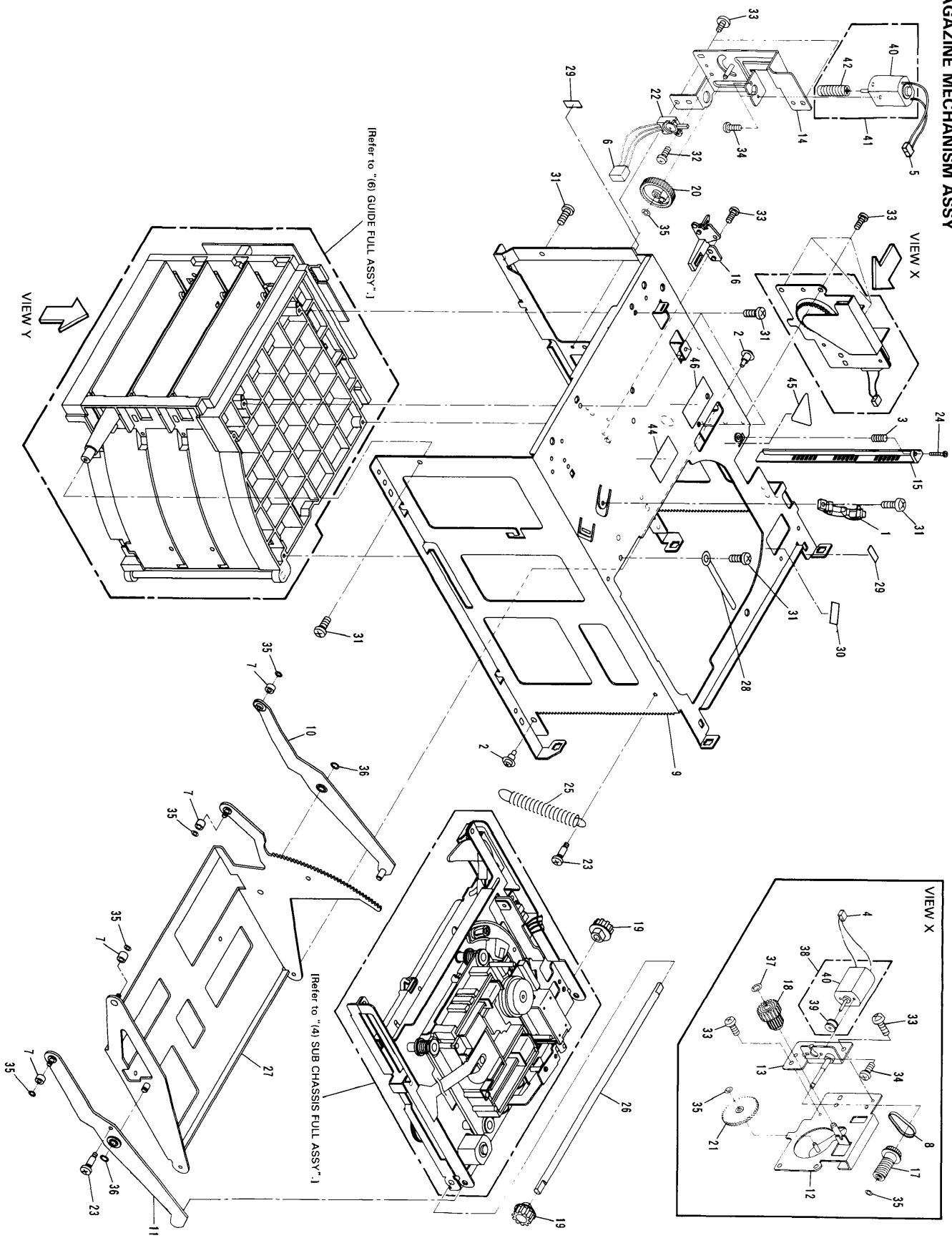
2.1 PACKING AND EXPLODED VIEWS

(1) PACKING





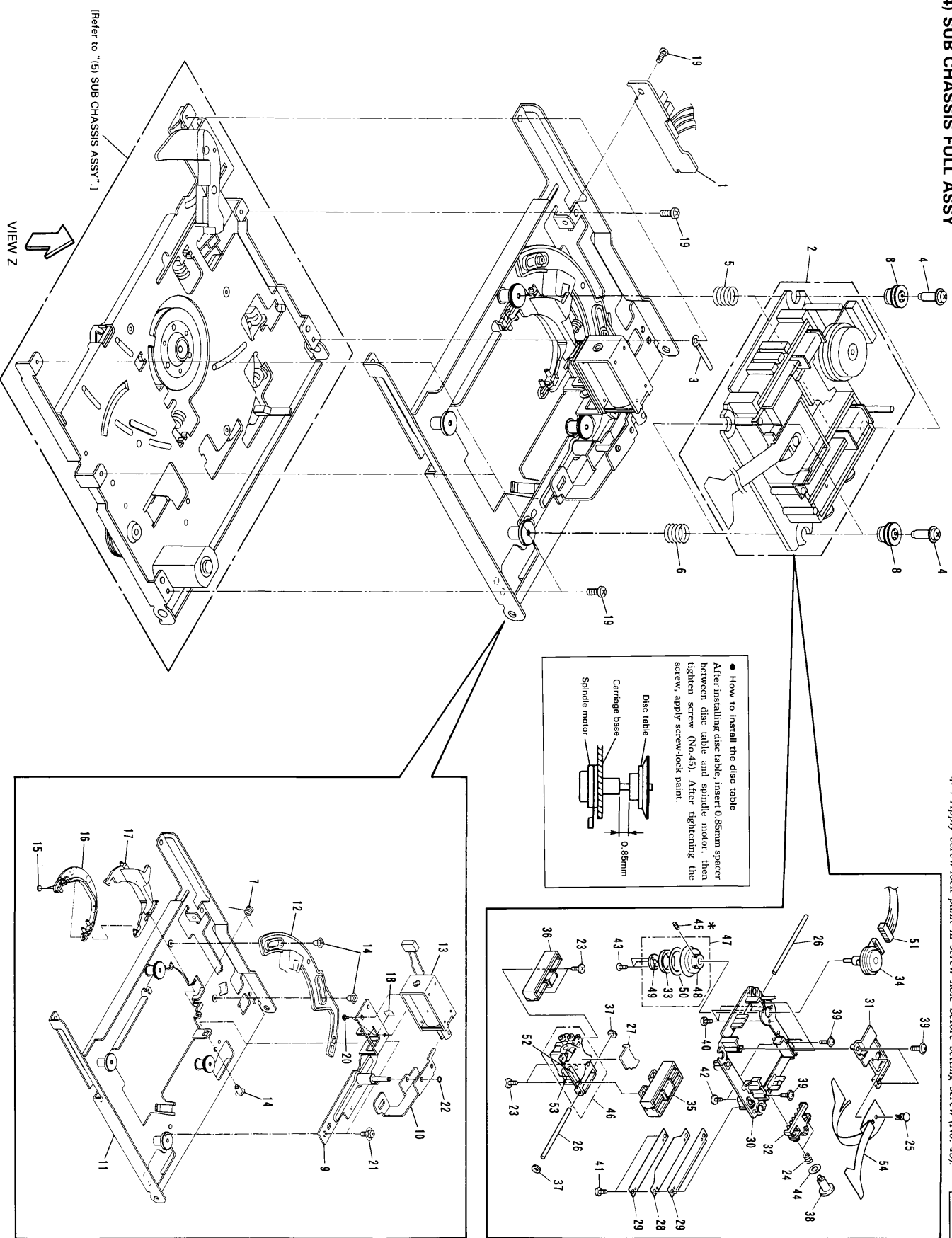
(3) 3 MAGAZINE MECHANISM ASSY

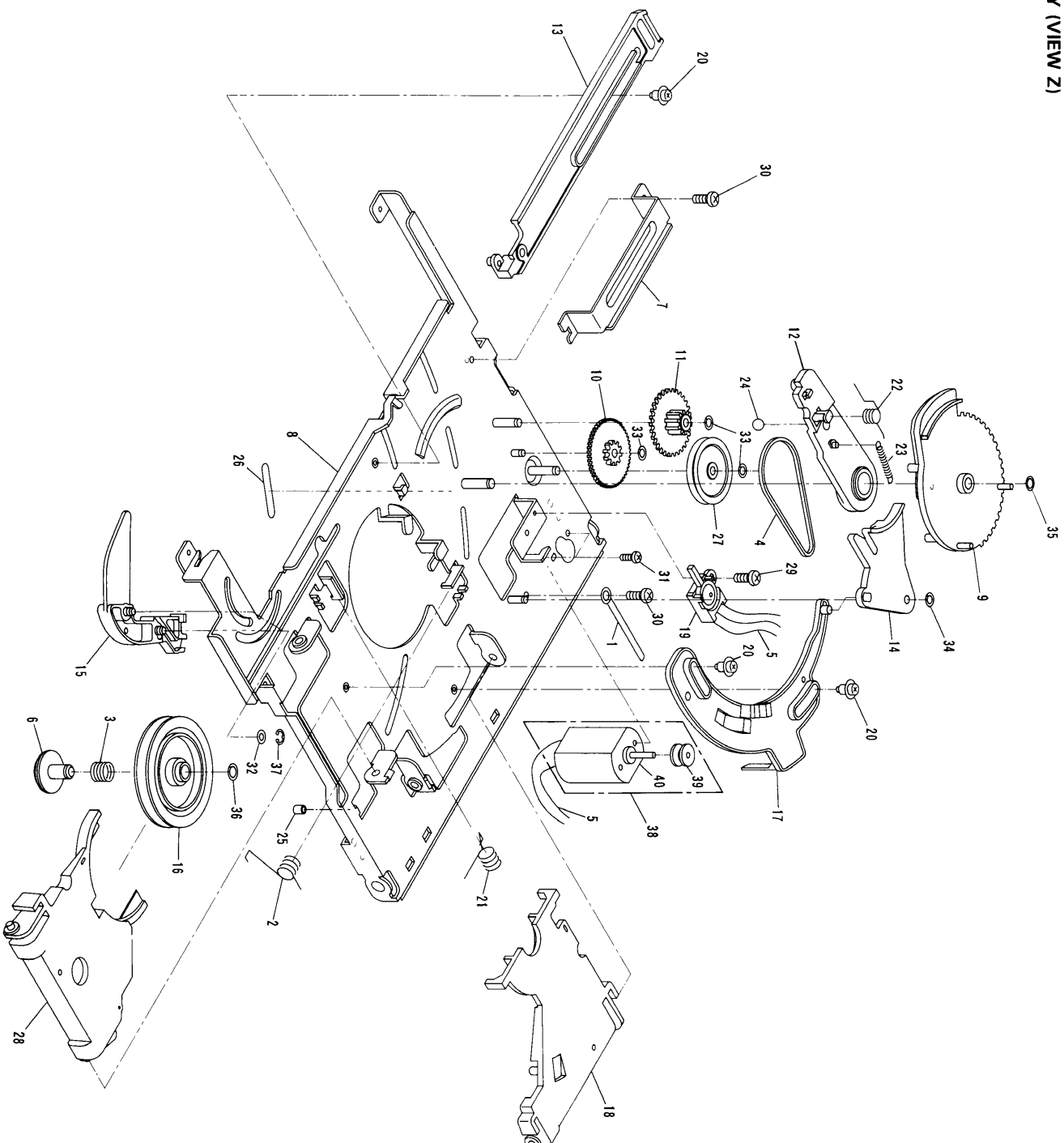


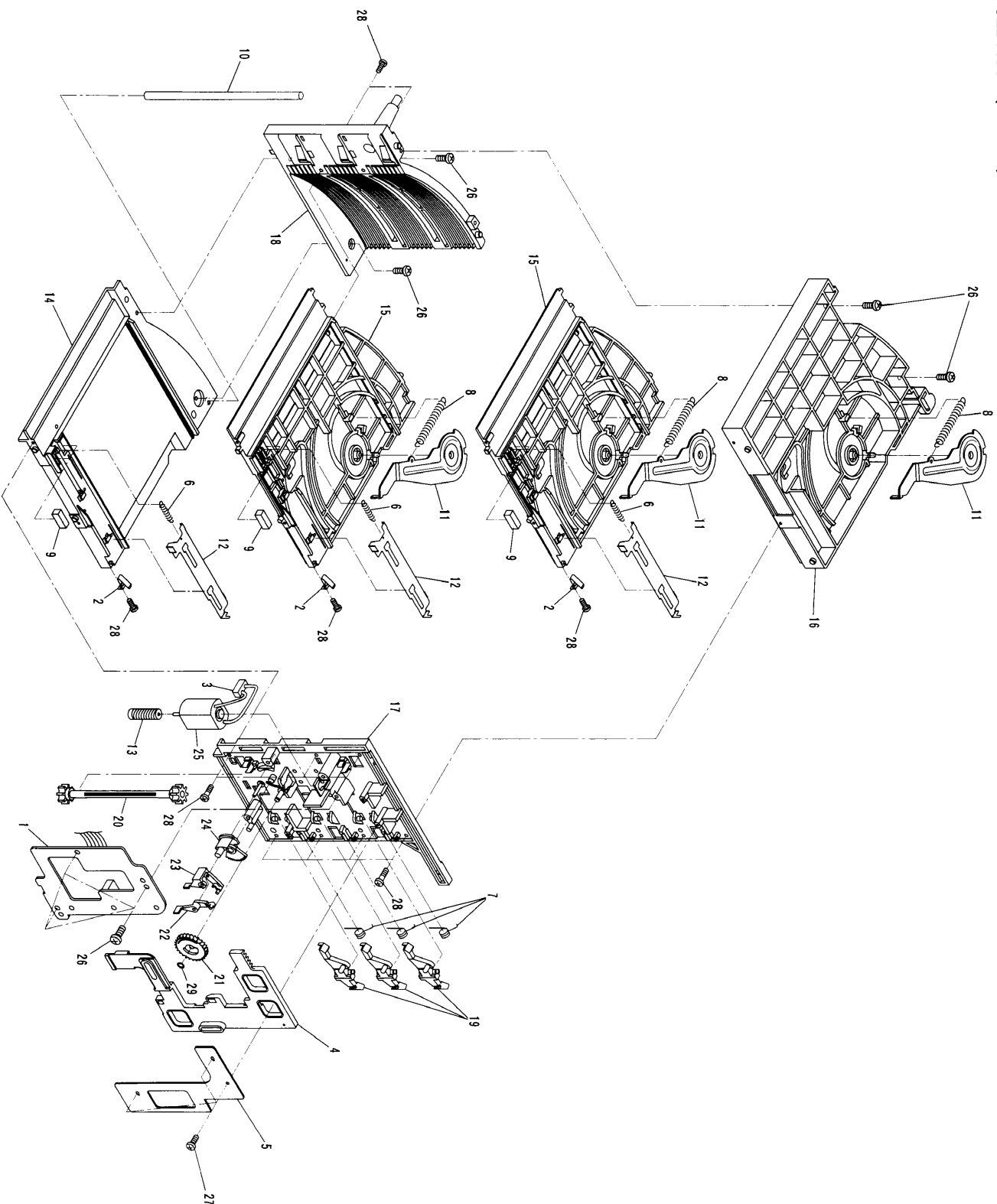
(4) SUB CHASSIS FULL ASSY

* : Apply screw-lock paint in screw hole before setting screw (No. 45).

DRM-1804X

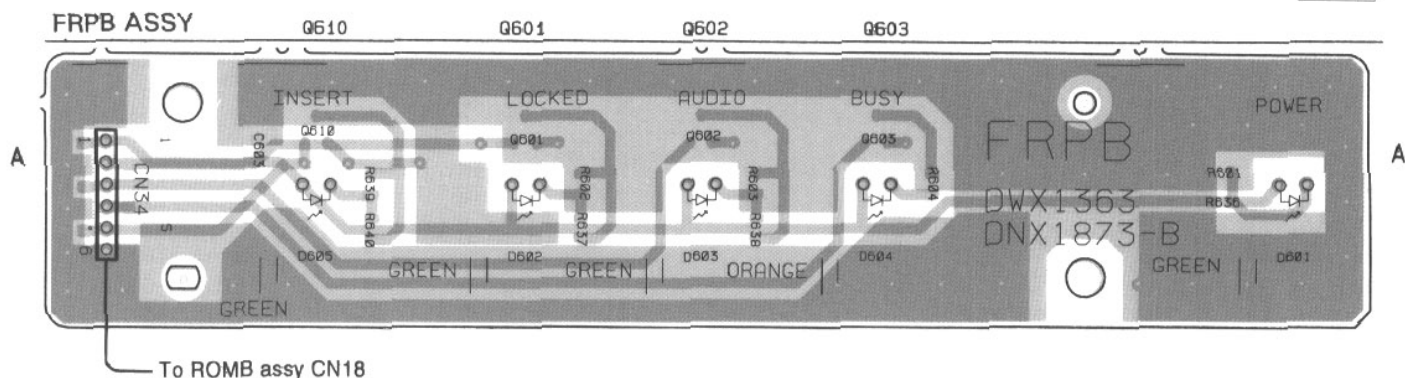




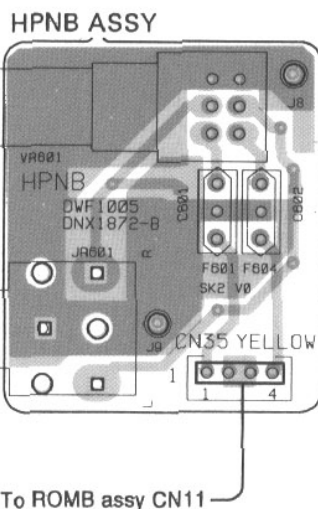
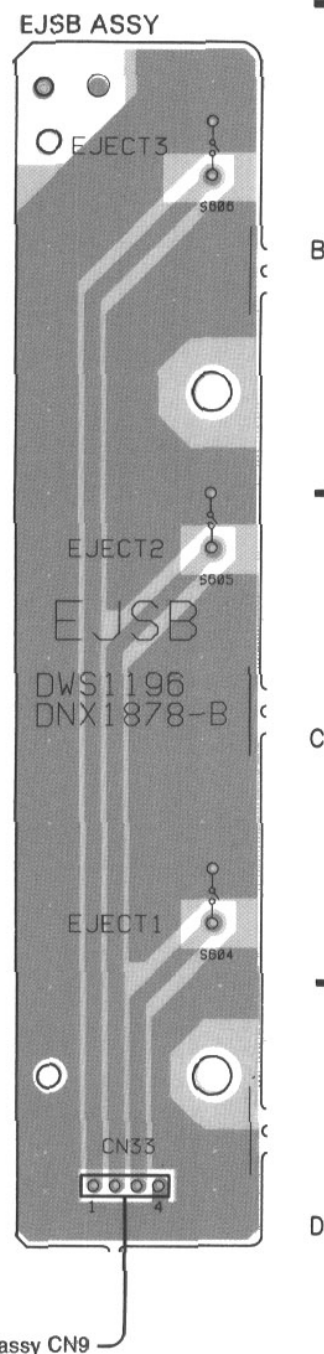
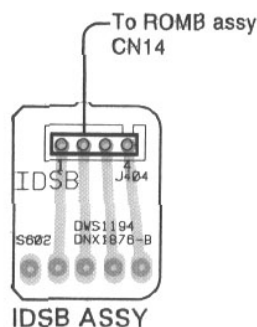
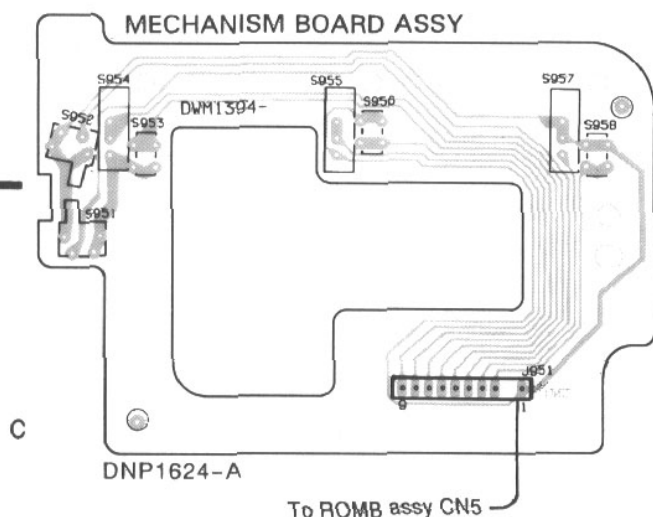
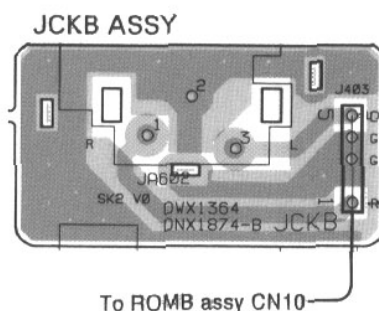
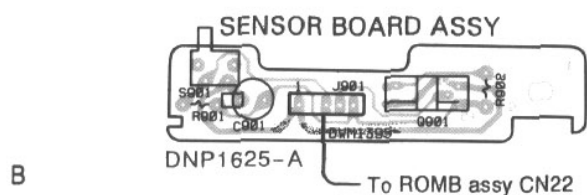


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SCH-1



- This diagram is viewed from the mounted parts side.



NOTE FOR PCB DIAGRAMS:

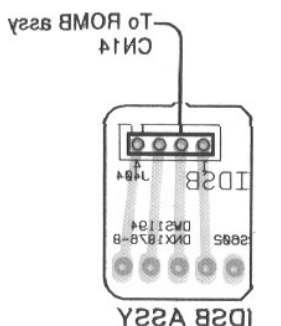
1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
		Transistor
		Transistor with resistor
		Field effect transistor
		Resistor array
		3-terminal regulator

- This diagram is viewed from the pink colored foil side.
- This PCB is double sided.



- This diagram is viewed from the foil side.

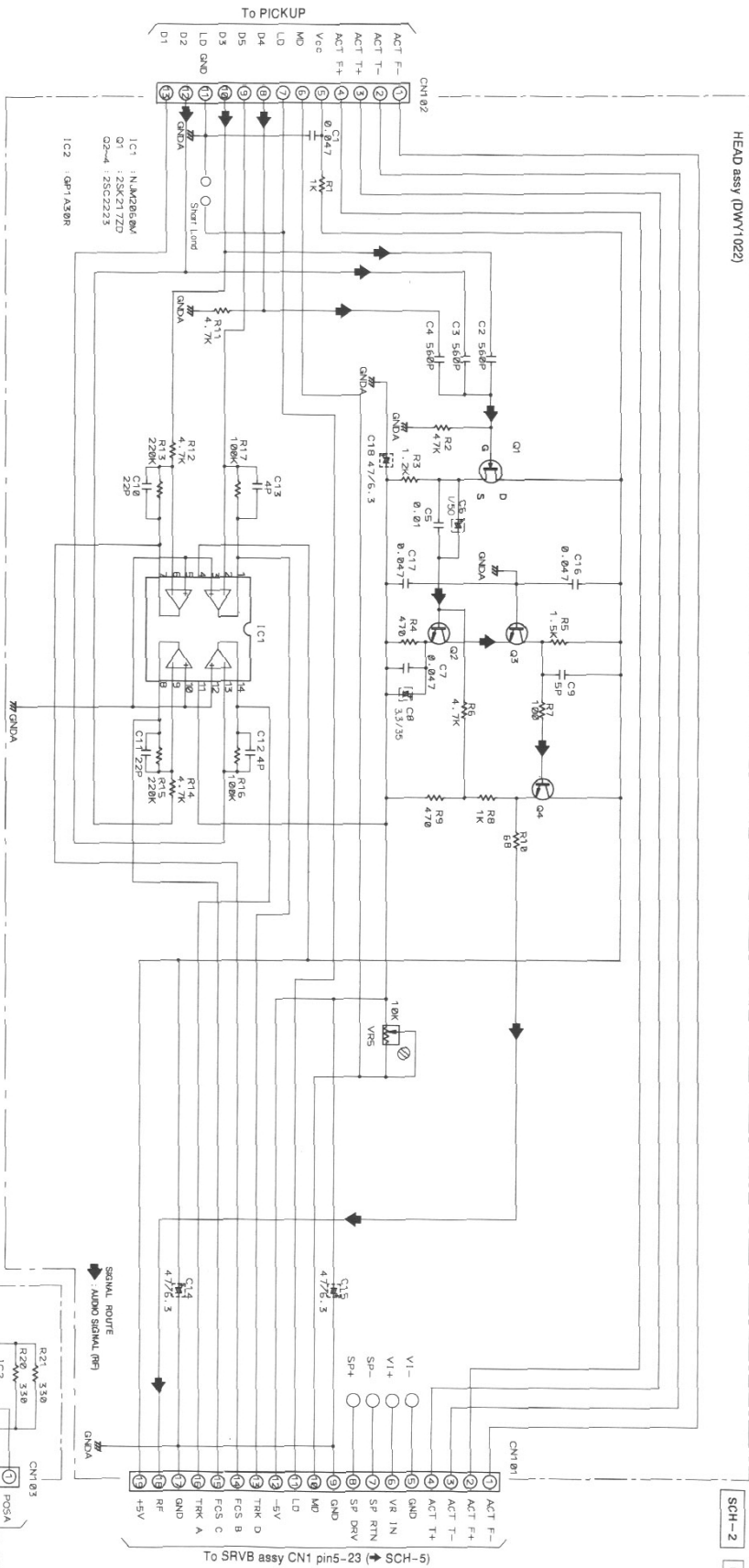


- This diagram is viewed from the gray colored foil side.
- This PCB is double side.



To ROMB assy CNA.

2. POSS ASSY AND HEAD ASSY



HEAD assy (DWY1022)

SCH-2 PCB-2

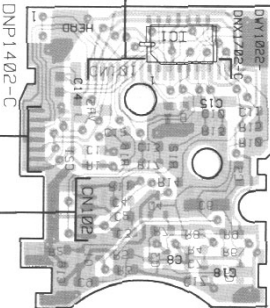
HEAD ASSY

IC1

G4

01 03 02

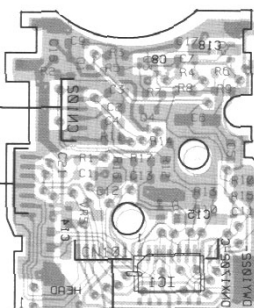
VHS



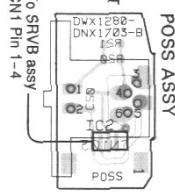
To SRVB assy CN1 Pin 5-23

To PICKUP assy

- This diagram is viewed from the pink-colored foil side.
- This PCB is double-sided.



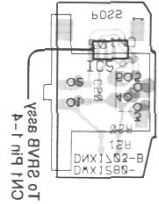
- This diagram is viewed from the gray-colored foil side.
- This PCB is double-sided.



To SRVB assy

CN1 Pin 1-4

- This diagram is viewed from the pink-colored foil side.
- This PCB is double-sided.



To SRVB assy

CN1 pin 5-23 (SCH-5)

- This diagram is viewed from the gray-colored foil side.
- This PCB is double-sided.

SCH-2

POSS ASSY, HEAD ASSY

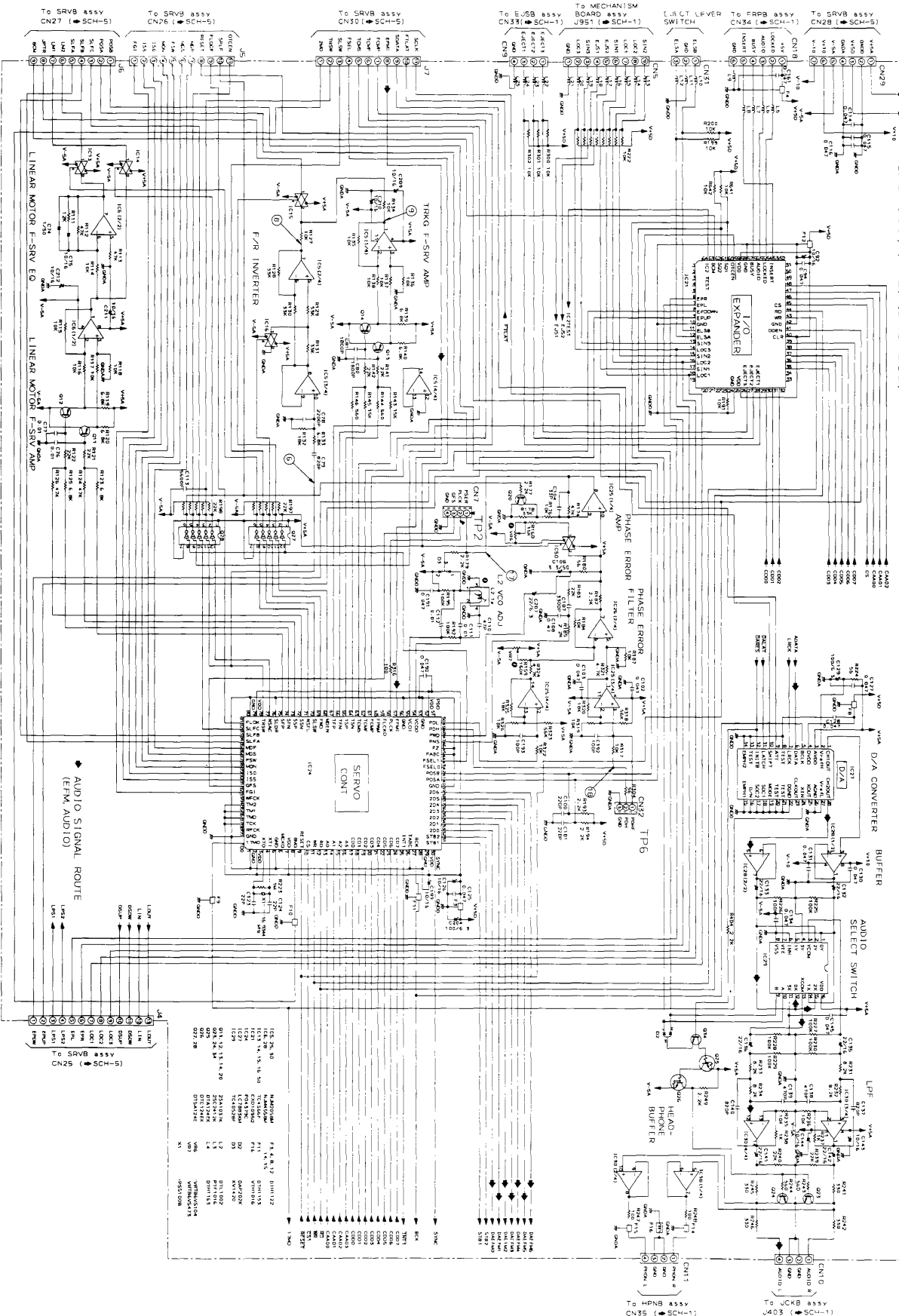
SCH-2

POSS ASSY, HEAD ASSY

3. ROMB ASSY AND SCSIB ASSY

3.1 ROMB ASSY (1/2)

ROMB ASSY (1/2) (DWG1383)



SCH-3

ROMB ASSY (1/2)

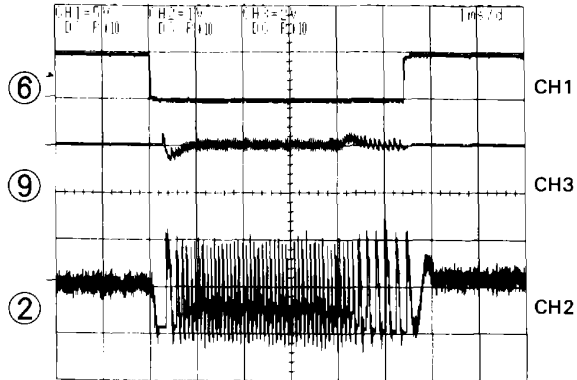
SCH-3

ROMB ASSY (1/2)

Waveforms (1/2)

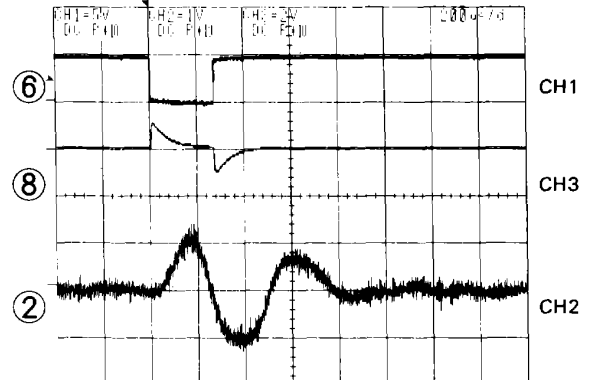
× 4 MULTI TRACK JUMP

CH1=5V/div., CH2=1V/div., CH3=2V/div.
1ms/div.



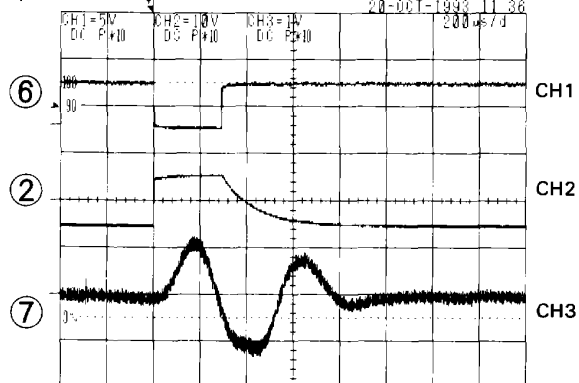
× 1 STILL

CH1=5V/div., CH2=1V/div., CH3=2V/div.
200μs/div.



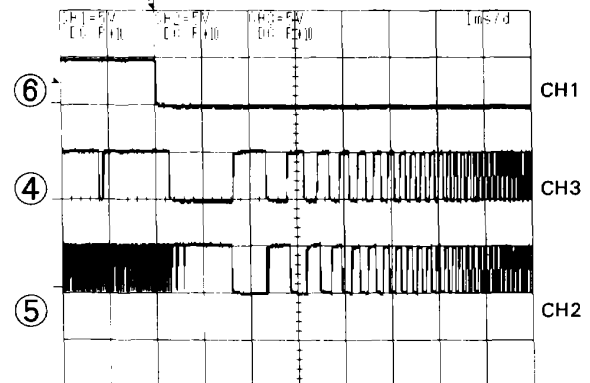
× 4 STILL

CH1=5V/div., CH2=10V/div., CH3=1V/div.
200μs/div.

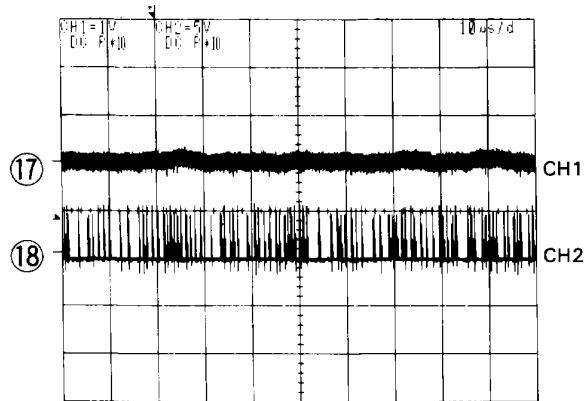


× 4 FWD (when SEARCH)

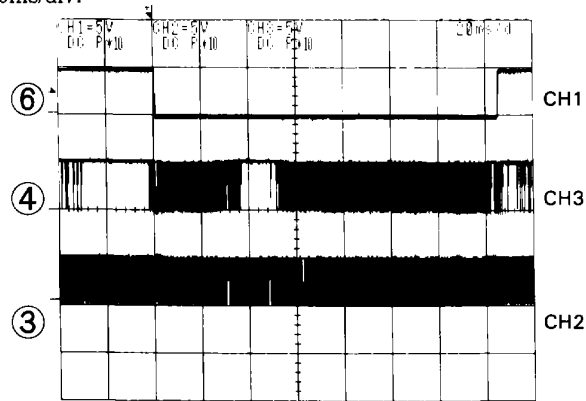
CH1=5V/div., CH2=5V/div., CH3=5V/div.
1ms/div.



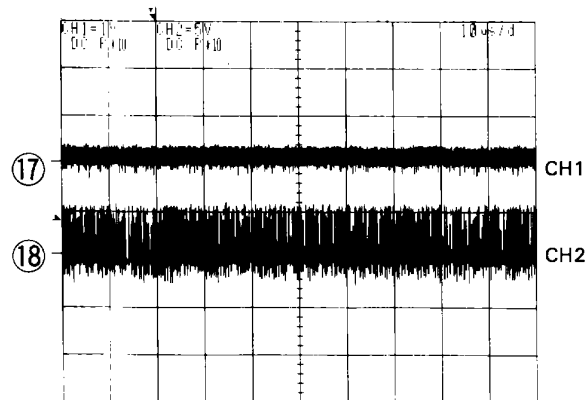
× 1 PLAY
CH1=1V/div., CH2=5V/div. 10μs/div.



× 4 SEARCH
CH1=5V/div., CH2=5V/div., CH3=5V/div.
20ms/div.



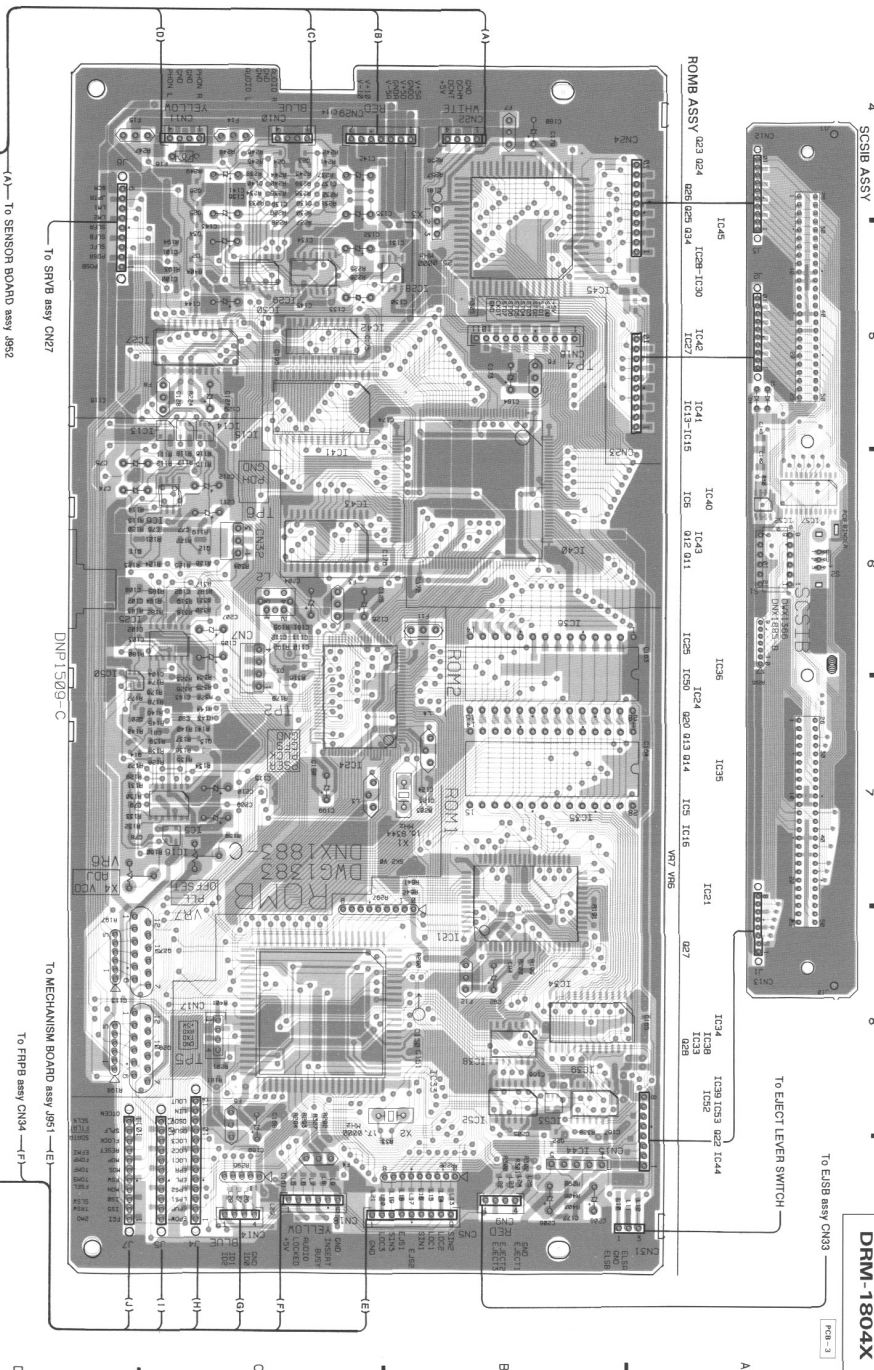
× 4 PLAY
CH1=1V/div., CH2=5V/div. 10μs/div.

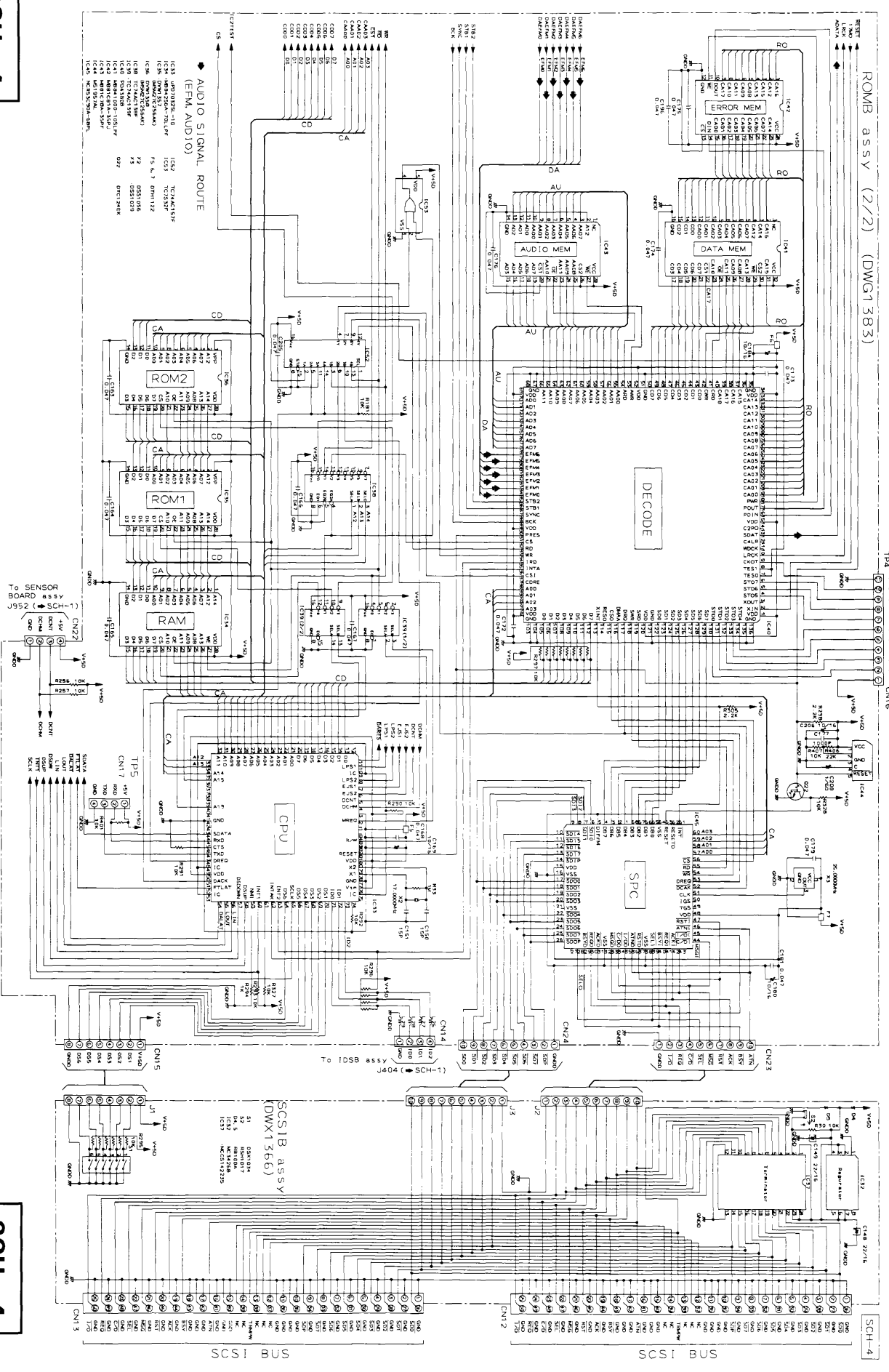


IC24 (PD4379C) POWER ON									
PIN NO.	VOLTAGE(V)	PIN NO.	VOLTAGE(V)	PIN NO.	VOLTAGE(V)	PIN NO.	VOLTAGE(V)	PIN NO.	VOLTAGE(V)
1	0	22	1.4	46,41	0	54	2.2	70	0
2	5	23	1.8	42	5	56	2.4	71	5
3,4	2.3	24	1.4	43	0	58	0	72-16	0
5	0	25	5	44	5	57	2.7	77	5
6	1.3	26	0	45,46	0	59	2.4	78	0
7	5	27	2.3	47	6.5	59	0	79	5
8	2.4	28	0	48	0.4	60	2.5	80	0
9	4.7	29,30	5	49-51	0	61-63	5.3	81	5.3
10-20	5	31,32	4.6	52	5	64-67	0	82	0
21	1.6	33-39	3	53	0	68,69	5	83,84	5

IC27 (LC7883KM) POWER ON									
PIN NO.	VOLTAGE(V)	PIN NO.	VOLTAGE(V)	PIN NO.	VOLTAGE(V)	PIN NO.	VOLTAGE(V)	PIN NO.	VOLTAGE(V)
1	2.6	34	2.4						
2,3	5.3	35	1.7						
4	4.9	36,37	0						
5	2.3	38	2.6						
6	0								
7	2.4								
8,9	0								
10-12	4.9								
13-22	0								
23	2								

IC21 (CXD1095Q) POWER ON									
PIN NO.	VOLTAGE(V)	PIN NO.	VOLTAGE(V)	PIN NO.	VOLTAGE(V)	PIN NO.	VOLTAGE(V)	PIN NO.	VOLTAGE(V)
1,2	0.2	36	2	46	2.4				
3-11	0	37	1.9	47-47	0				
12-18	5	38	2	51-60	5				
19-25	0	39	1.4	61,62	0				
26-29	5	40	5	63	5				
30	1.9	41	4.7	64	0				
31,32	1.7	42	0						
33	2.7	43	4.8						
34	0	44	2.1						
35	2.2	45	5						





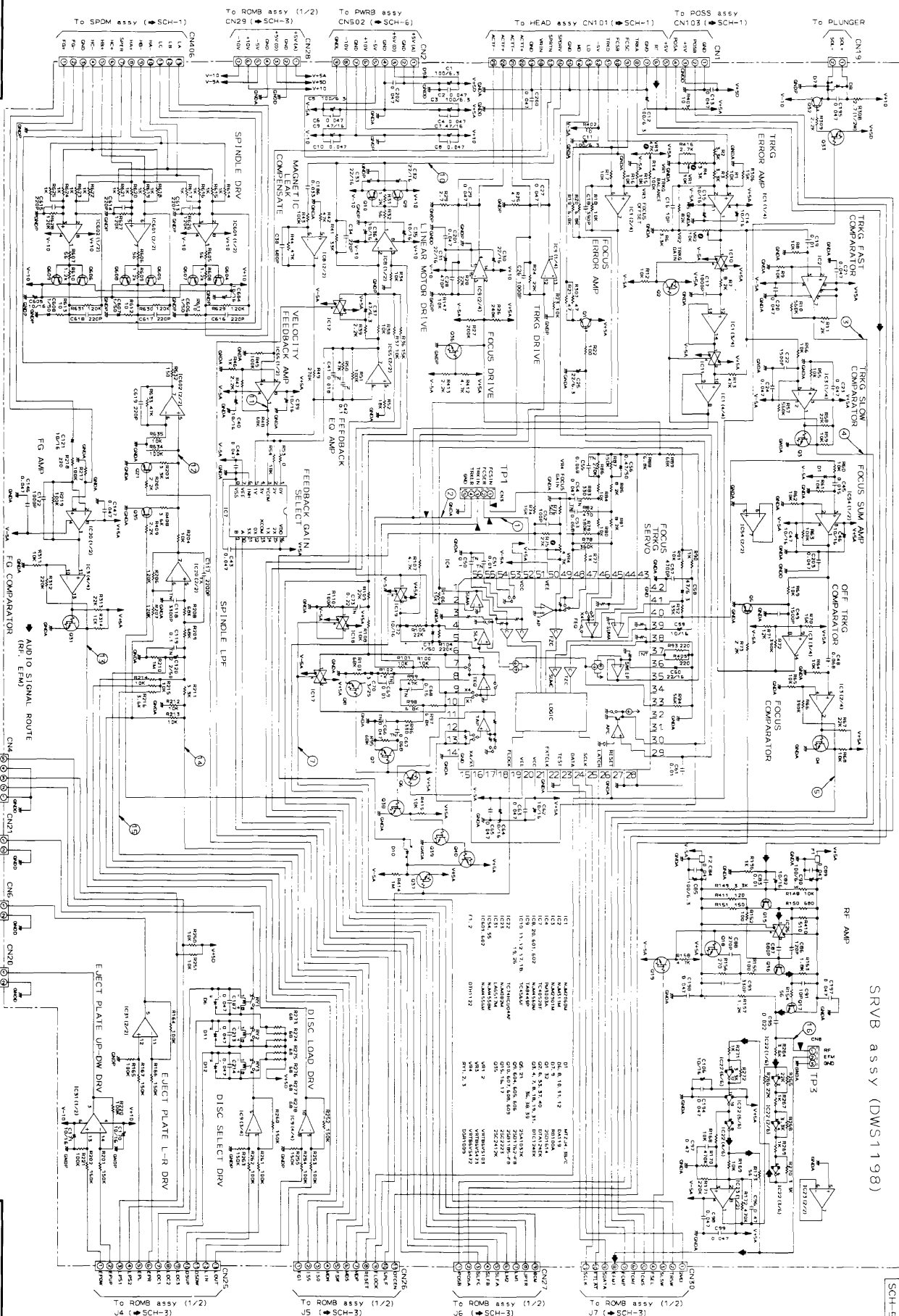
SCH-4

ROMB ASSY (2/2),
SCSIB ASSY

SCH-4

ROMB ASSY (2/2),
SCSIB ASSY

4. SRVB ASSY



SCH-5

SRVB ASSY

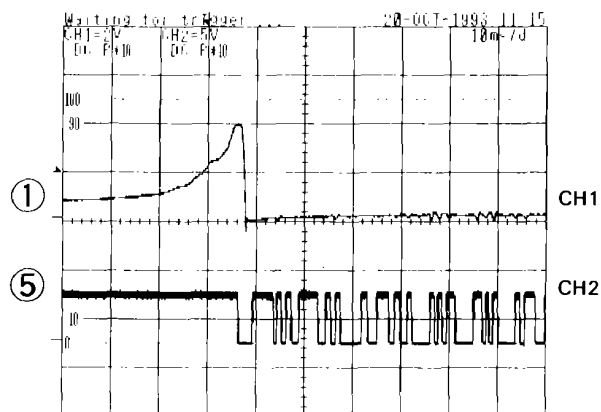
SCH-5

SRVB ASSY

Waveforms (2/2)

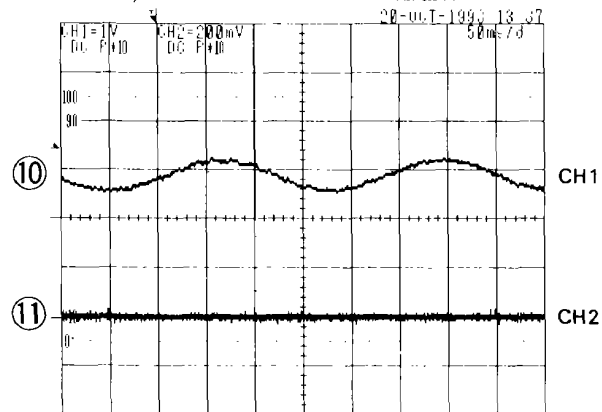
FOCUS IN

CH1=2V/div., CH2=5V/div. 10ms/div.



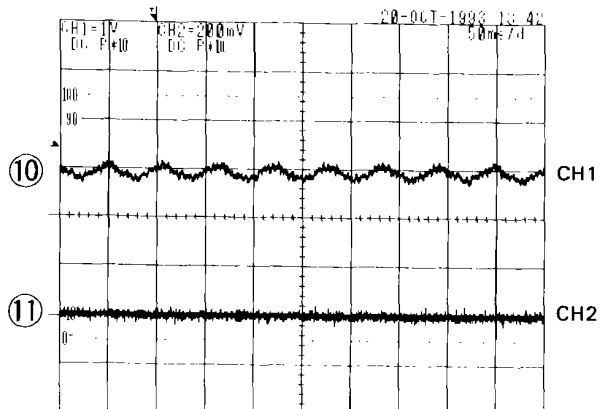
× 1 PLAY

CH1=1V/div., CH2=200mV/div. 50ms/div.



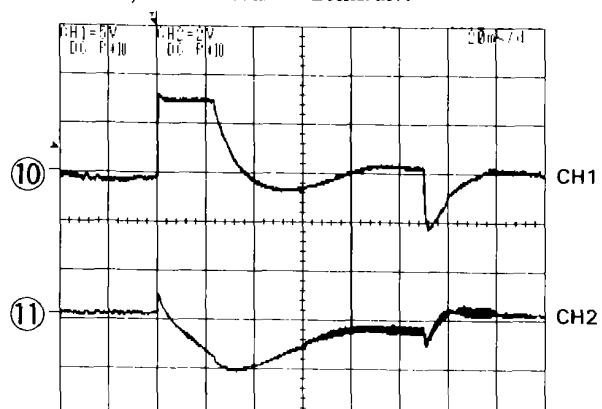
× 4 PLAY

CH1=1V/div., CH2=200mV/div. 50ms/div.



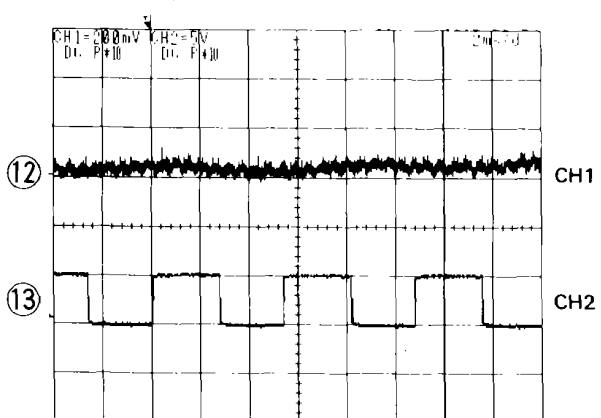
× 4 SEARCH

CH1=5V/div., CH2=2V/div. 20ms/div.



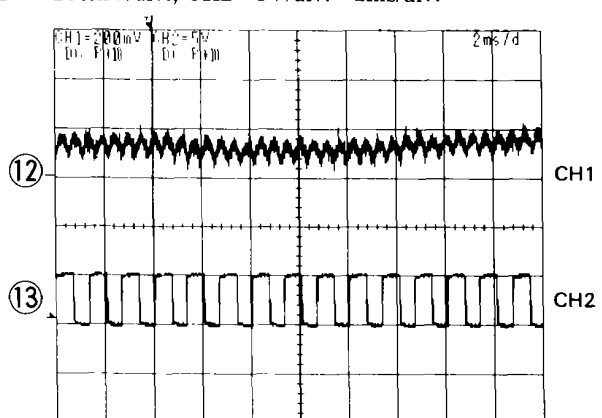
× 1 PLAY

CH1=200mV/div., CH2=5V/div. 2ms/div.



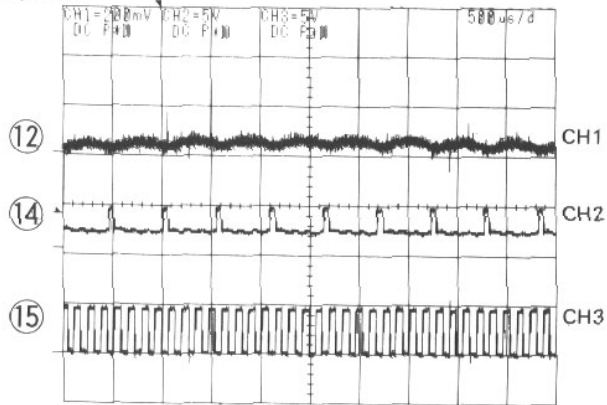
× 4 PLAY

CH1=200mV/div., CH2=5V/div. 2ms/div.



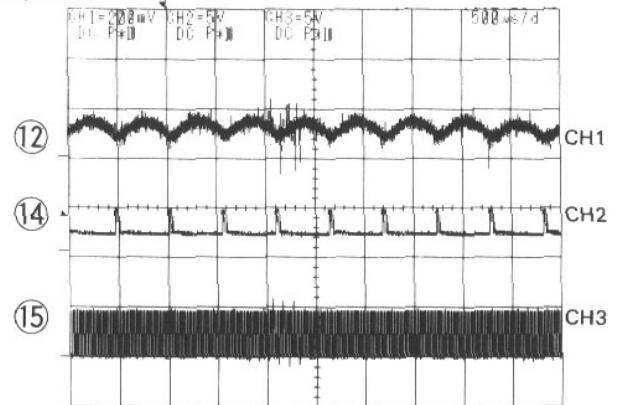
× 1 PLAY

CH1=200mV/div., CH2=5V/div., CH3=5V/div.
500 μ s/div.



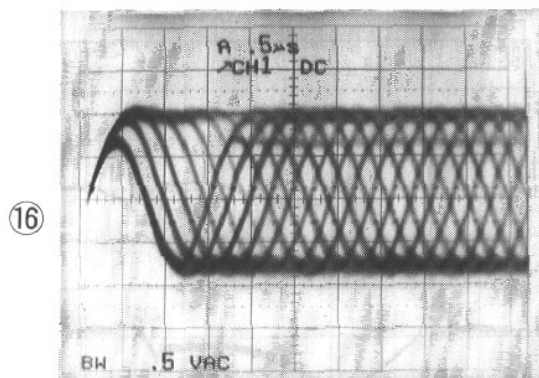
× 4 PLAY

CH1=200mV/div., CH2=5V/div., CH3=5V/div.
500 μ s/div.



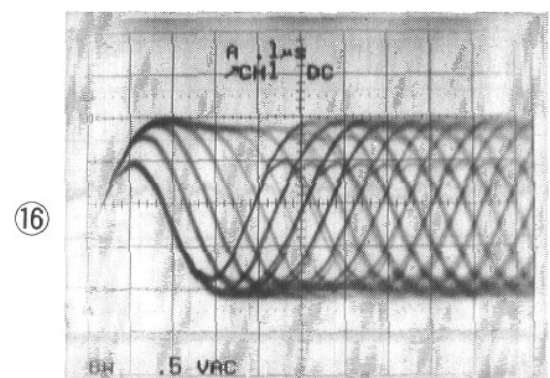
× 1 PLAY

0.5V/div. 0.5 μ s/div.



× 4 PLAY

0.5V/div. 0.1 μ s/div.



IC4 (PM3003A) POWER ON

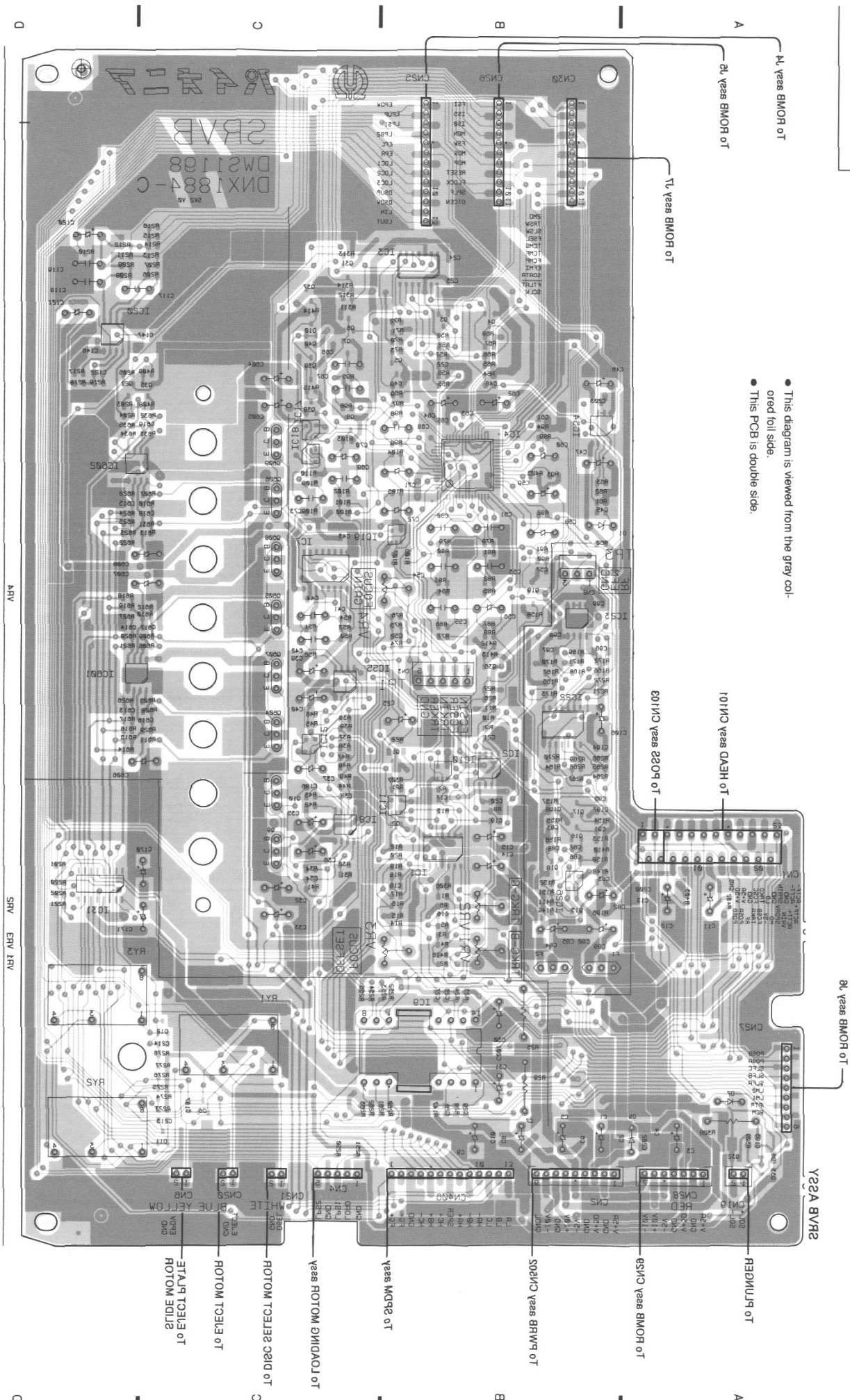
PIN NO.	VOLTAGE (V)	PIN NO.	VOLTAGE (V)	PIN NO.	VOLTAGE (V)
1-14	0	29	-5	53-56	0
15	0.1	30	0		
16, 17	0	31, 32	-4.2		
18	5.3	33	-3.7		
19	-5.1	34-36	0		
20	5.3	37	-4.4		
21	2.3	38-49	0		
22, 23	0	50	-5.1		
24-26	4.9	51	0		
27, 28	0	52	5.3		

To ROMB assy J4 —

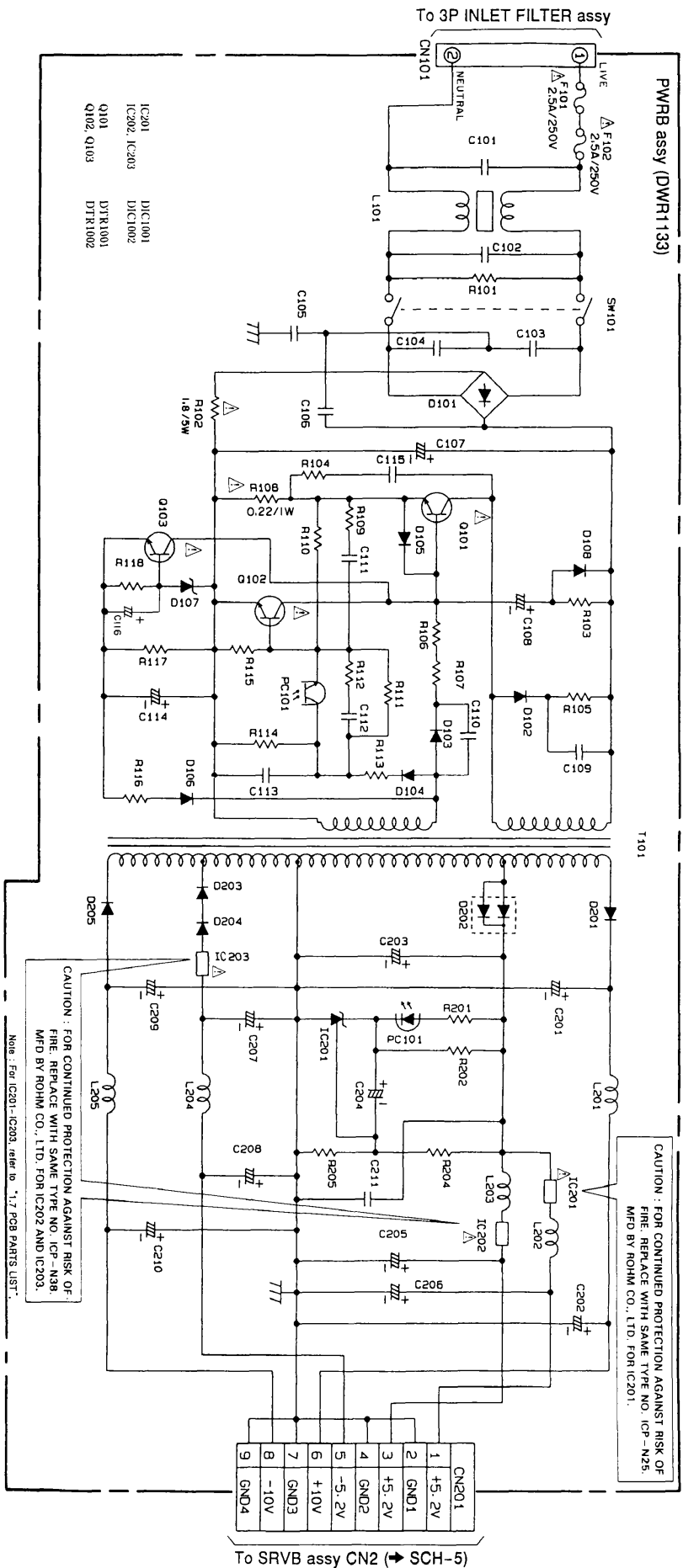
[illegible]

IC3
Q34

- This diagram is viewed from the gray colored foil side.
- This PCB is double side.



5. PW/RB ASSY



SCH-6

SCH-6

PW/RB ASSY

SCH-6

PW/RB ASSY

2-40